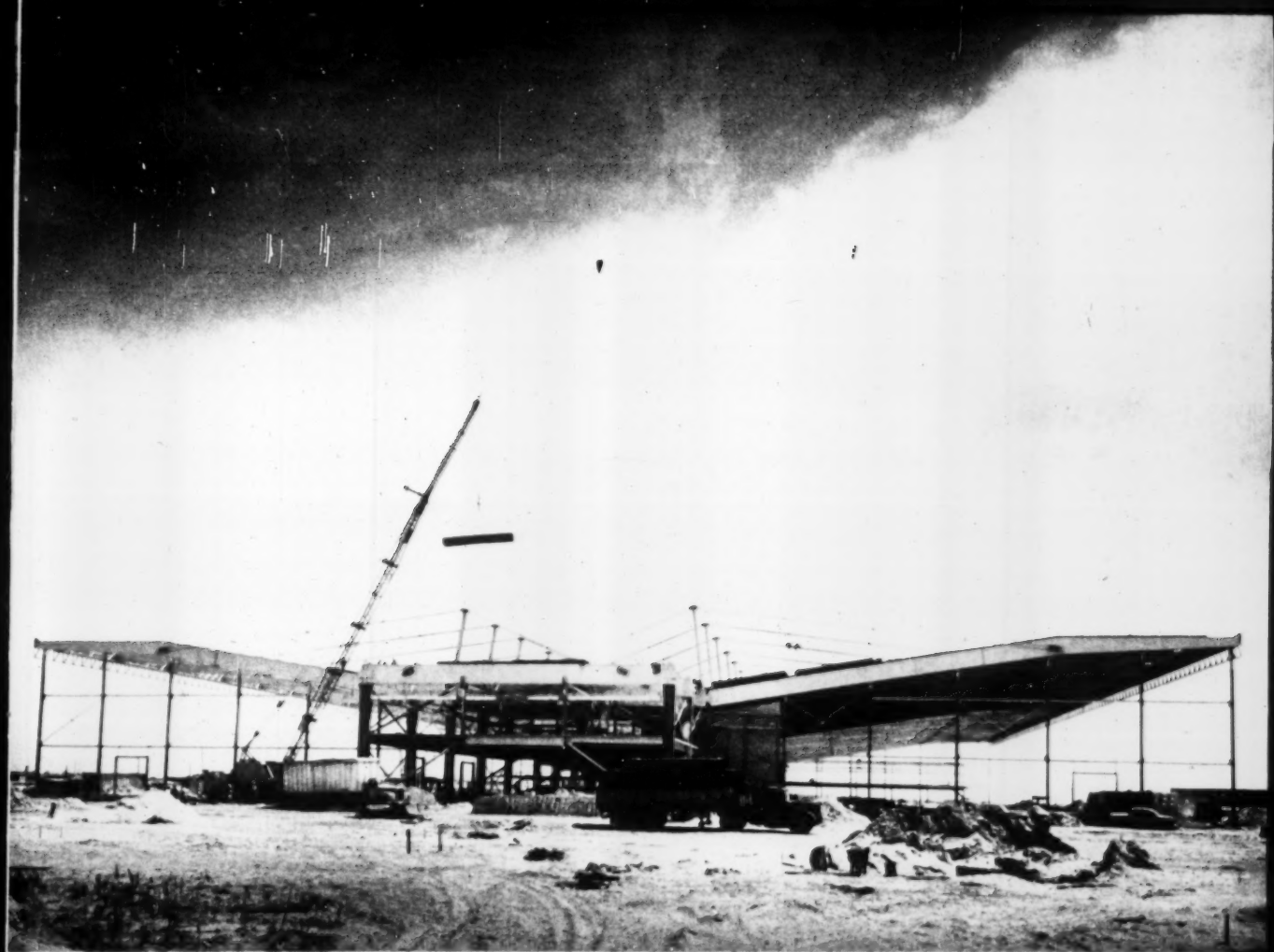
ENGINEERING NEWS-RECORD



Double-cantilever makes a 400-foot cover for jets p.34

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WATERSPHEROID®

A sound investment in Plant Security and a Landmark of company progress . . .

Big Brother to the Watersphere®, the Horton Waterspheroid is engineered to provide dependable gravity pressure for plant water and or sprinkler reserves in capacities up to 500,000 gallons.

Whether your water requirements are large or small, a graceful Horton structure can complement both the utility and the beauty of your modern plant by:

(1) Saving up to 60% in fire insurance premiums.

(2) Providing the promotional benefits of *skyline advertising.*

Write our nearest office for descriptive literature on the Watersphere or the Waterspheroid.

250,000-gallon Waterspheroid graces the skyline above Automatic Electric Company plant at Northlake, Illinois. Provides reserves for sprinkler system and plant water. Furnished through The Austin Company.

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PORTER BROWN LIMESTONE COMPANY—

100% MURPHY DIESEL

Plant at Springfield, Tenn. . . . . 100% MURPHY POWERED

Plant at Oneonta, Alabama . . . . . 100% MURPHY POWERED

Owner Porter Brown and Superintendent William Boring . . 100% SOLD ON MURPHY DIESEL

Here's why Porter Brown Limestone Company, of Springfield, Tenn., *specifies* Murphy Diesel power when they buy crushing equipment—

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Porter Brown's plant at Oneonta (shown below) is averaging 1500 tons per day of $1\frac{1}{4}$" minus limestone. A 161 HP (continuous) Murphy Diesel powers the jaw crusher and vibrating grizzly in the portable primary, another 161 HP Murphy powers the cone crusher intermediate scalping unit, while a 107 KW Murphy Diesel-Electric Generator Set meets the electrical requirements of the plant.

Aggregate producers and contractors throughout the country are swinging to dependable, economical Murphy Diesels for both portable and stationary plant operations.

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For stationary installations, Murphy's steady, uniform power and low fuel costs assure efficient power for crushers, screens, conveyors, washing equipment, etc. And don't overlook the economy advantages of Murphy Diesels for generators, pumps, compressors, or for powering or re-powering shovels. 408N

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HEAVY-DUTY POWER for Construction

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

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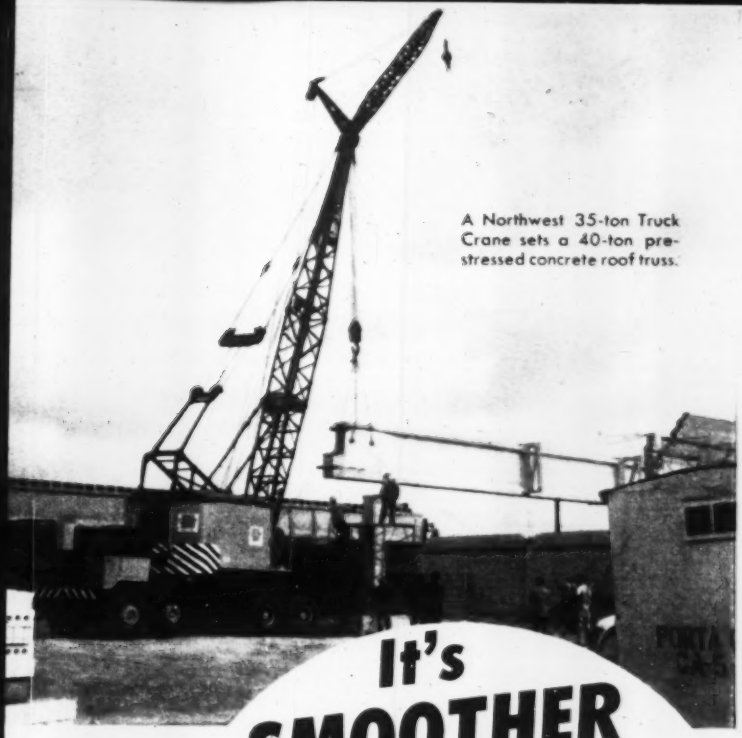

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● The Truck Crane you buy should bring you the ability to handle the widest range of lifting and reaching that your job problems call on you to do. Northwest Truck Cranes put Northwest versatility and flexibility on wheels. Their rugged design brings you the same cast alloy Steel Machinery Bases and Machinery Side Frames proved in years of service in Northwest Crawler Equipment, and assures the rigidity that maintains shaft alignment and reduces wear. They bring you Uniform Pressure Swing Clutches so important for accuracy in spotting loads in crane work. The Northwest "Feather-Touch" Clutch Control for main drum clutches retains the feel of the load. True Power Load Lowering on the hoist is gear driven through Uniform Pressure Clutches with single-lever control. Independent High Speed Boom Hoists are heavy-duty for hour-after-hour service, power controlled in both directions and independent of all other machine operations.

Every feature you need is available, Sectional Boom Hoist Rigging and pendant lines, Pivoted Gantries, Telescopic Boom Struts, Removable Counterweight—plus a host of carrier advantages to make your job easier. There is a lot more to the story. Ask for details on the size you need. Two sizes, 25-ton and 35-ton capacity.

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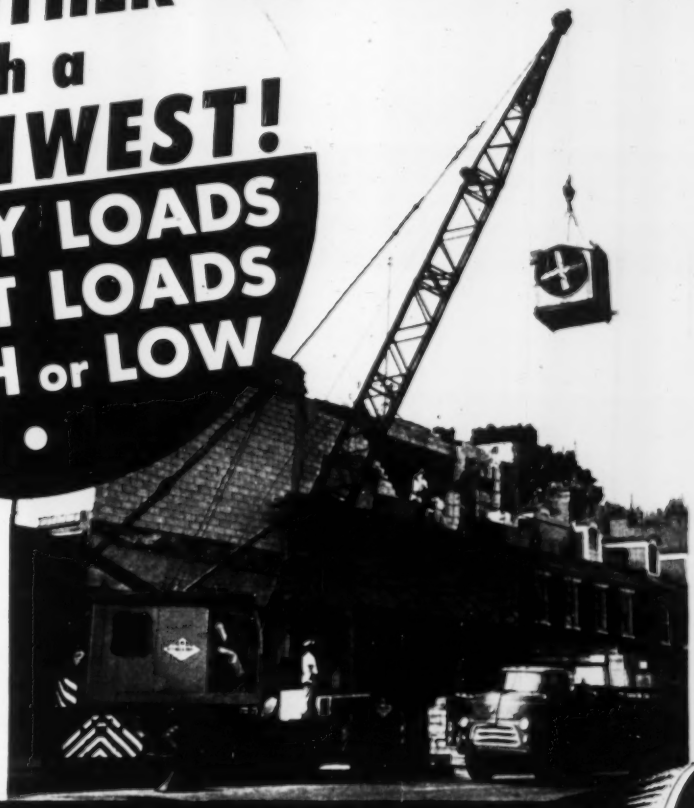

A Northwest 25-ton Truck Crane spots an air-conditioner assembly to the fourth floor of a building.

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NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
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T-25-27-LC

HARBERT USES TEXACO 100% ON FLORIDA PIPELINE PROJECT

TEXACO PLAN makes mobile lube rig a complete service station

Harbert Construction Corporation, Birmingham, Alabama, cites fine performance record of Texaco lubricants

Although their work on the natural gas pipeline for Florida ranges over 1,000 miles of pipeline, Harbert Corporation's equipment is never out of reach of complete lubrication. The reason: mobile lubrication rigs. And with the Texaco Simplified Lube Plan, each rig is completely equipped to service any lube point on any machine, wherever it's working. There's no time lost deadheading equipment back to a fixed service center. As a result, all equipment gets proper lubrication at the right time.

Systematic lubrication is easier with the Texaco Plan, too. The Texaco Plan indicates clearly what lubricant goes where, and how often, so equipment delivers peak performance. And simplified inventory saves man hours in storage and handling, cuts the chance of lubricant misapplication.

A Texaco Simplified Lubrication Plan can cut costs and boost performance on your next project. Just call the nearest of the more than 2,000 Texaco Distributing Plants, or write:

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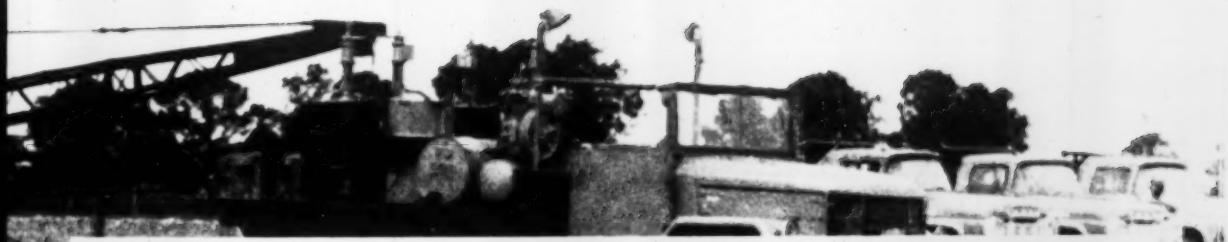
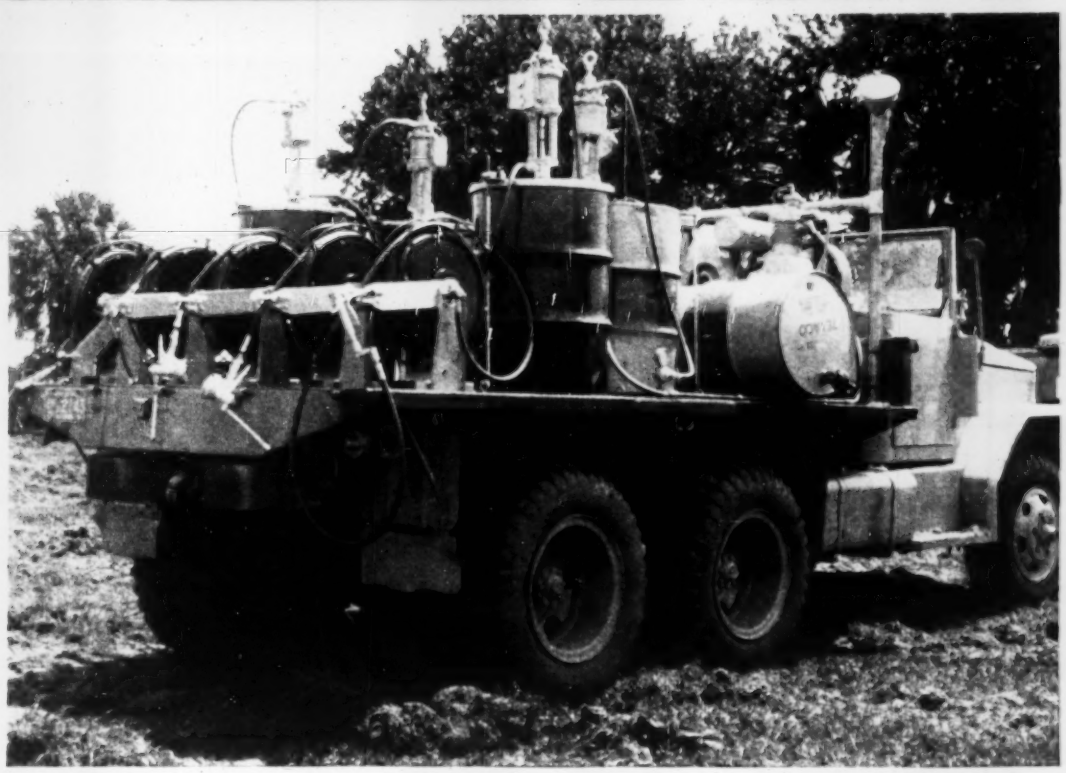
Texaco Inc., 135 East 42nd Street, New York 17, New York.





COMPLETE SERVICE, ANYWHERE,

is possible with a mobile rig and a Texaco Simplified Lube Plan. A Texaco Plan cuts inventory so you can put every lubricant you need for every machine on a single truck.

TEXACO

IN ALL STATES

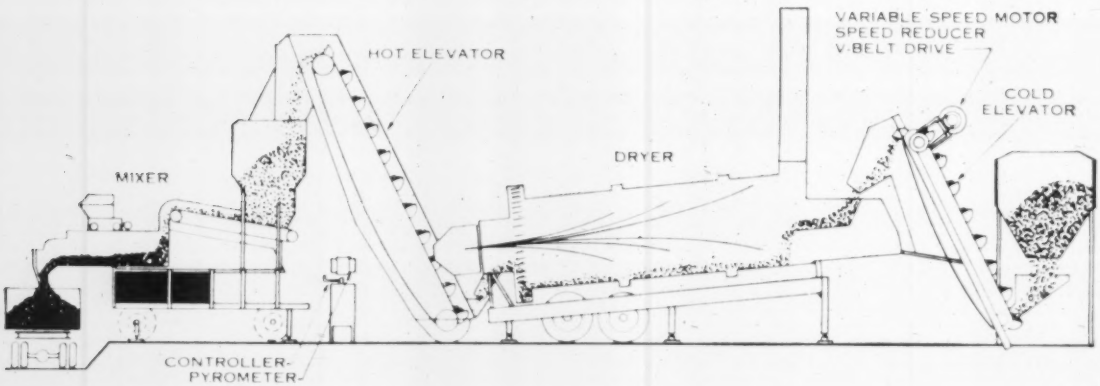
LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

engine power BY CATERPILLAR

ARE YOU OVERLOOKING THE MANY AVENUES OF REPOWERING PROFIT?

Discussions of repowering are usually confined to the replacement of worn-out engines in excavating machines or rock crushers. However, competition in construction today makes it imperative to look at the profitability of every machine in a contractor's spread. To increase profit, replacing engines or changing from utility power to portable electric set power may be required. Converting from gasoline to diesel can also take a machine "out of the red." Frequently changing over from mechanical drives to electric motor drives on some construction machines will enhance performance, production and profit.



For example, in an asphalt plant like the one shown, a power change increased production 15% and increased mobility, too.

Instead of the mechanical drives on product conveyors, the plant uses electric motors powered by the Cat Diesel Electric Set. No longer must the operator constantly check cold elevator feeding, drying temperature and moisture content of stockpiled aggregate.

Now a single switch at the dryer temperature gauge controls the cold elevator to supply exactly the amount of aggregate the unit's dryer is able to handle properly.

No need to adjust feed gates or dryer flame. Similarly, electrification of a crushing plant can offer sizable improvements in performance and production.

To help you see how your present power stacks up—and to analyze the right power for your equipment, you can receive a "Repowering Handbook Packet" on request. This informative material discusses power replacement in all its aspects and gives you money-saving guides to engine buying. Write to Engine Division, Caterpillar Tractor Co.

CATERPILLAR

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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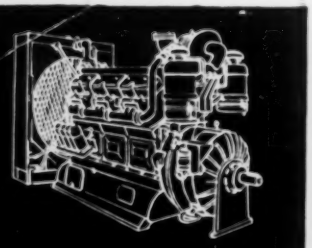
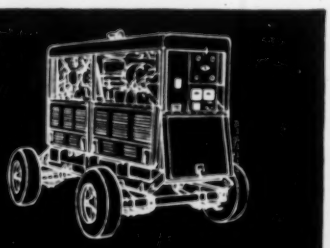
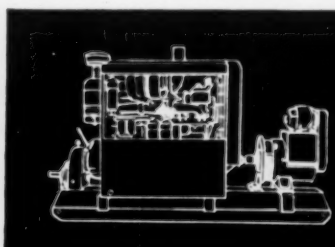
Mechanical drives, fluid couplings or torque converters are available on industrial versions of Caterpillar Diesel Engines.



Your electrical power requirements vary widely. Caterpillar offers portable or stationary Diesel Electric Sets from 30 to 350 KW.



New "two-handed" configurations increase engine's versatility—with electric generator at one end and a mechanical drive at the opposite end.



ON A BIG-TIME DEAL?

Go with Goodyear—for Big-Job Profit Protection!

END BIG-TIRE GUESSWORK. Let Goodyear Big-Tire Specialists check into every condition you'll face on this job.

Terrain problems, climate, loads, haul roads, schedules, speeds, your own equipment—they'll take all factors into consideration.

Then they'll advise you on the exact tread and tire designs—from Goodyear's specialized big-tire lineup—to do the best job at the least cost.

GET BIG-TIRE KNOW-HOW. Goodyear is Big-Tire Headquarters—as builders of more pneumatic tires than anyone else in the world.

Leaders in design—in rubber chemistry—in construction advances, Goodyear exclusives include tread compounds exactly suited to your kind of work; Triple-Tough 3-T Nylon Cord that's processed for Tension, Temperature and Time to armor your tires against failure and down time.

GET BIG-TIRE SPECIAL SERVICE. Goodyear Big-Tire Specialists go *all* the way. They'll help you set up an operating and maintenance program to keep your tires in top condition *all* the time, and for longer life, too.

And if your job requires it, Goodyear contractor service personnel will stay right on the job with you—handling all your tire maintenance and repair needs.

And BIG-TIRE PERFORMANCE!
Example: SURE-GRIP LUG

Typical of Goodyear's service—having the right tire for *every* wheel—here's the Sure-Grip Lug as shown on the left. Noted for performance, its new "square" shoulder design features extra-thick rubber for deeper bite and far longer wear. Yet it's priced with conventional wide-base tires!

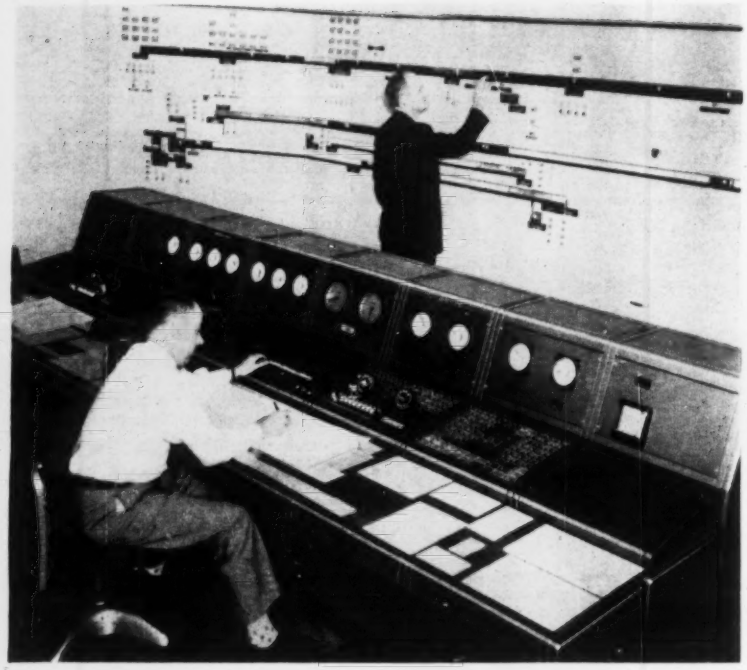
You'll be ahead if you see your nearby Goodyear dealer—or write: Goodyear, Truck Tire Dept., Akron 16, Ohio.

Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

TRUCK TIRES BY

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND



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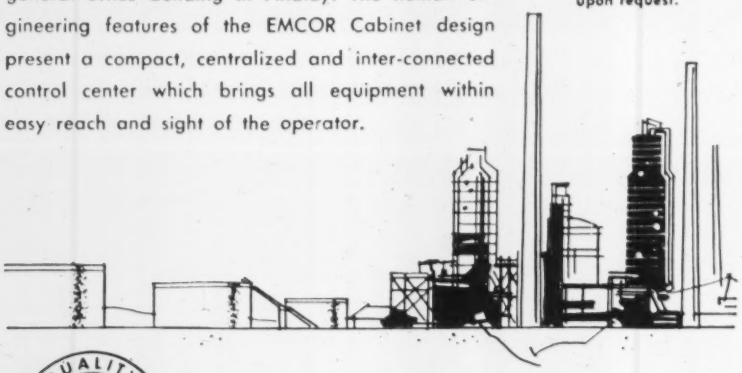
A new microwave communications system meets the demanding requirements of keeping oil moving along a cross-country pipeline 24 hours a day for the Ohio Oil Company, Findlay, Ohio. Voice control and supervisory channels plus selective telemetering of pipeline operations are handled from a control center housed in EMCOR Modular Enclosures in the general office building in Findlay. The human engineering features of the EMCOR Cabinet design present a compact, centralized and inter-connected control center which brings all equipment within easy reach and sight of the operator.

Your copy of Catalog 106 available upon request.



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Reader Comment

Unions Not the Answer

Sir—Congratulation on your fine article on engineering unionism (ENR Apr. 23, p. 30). As a relatively young (30) non-member of the American Society of Civil Engineers, I find the idea that unions are a solution to ineffectual professional societies an absurd one. It is illogical to conclude that, because one fails to do its job, the other is an answer.

Our potential "benefactors" (union leaders) are interested in power, not in correcting exploitation, either real or imaginary. They are concerned with their own self-preservation, not someone else's welfare.

Unless management and our professional societies get off the dime and take positive action, however, it appears that many engineers may exploit themselves by unionizing. They will find it to be a Trojan Horse. As difficult as the problem may be at present, the profession would then wallow hopelessly in a mire of mediocrity.

If supposedly intelligent and educated men are willing to forfeit their professionalism by unionizing, why not go a step further and eliminate registration, or even the universities themselves?

I like to feel that this "anti-union attitude" with regard to engineering is a product of thought and not because my mind, feeble as it may be, has been "poisoned."

Thank you, no! I am not quite ready to sell out to the likes of Walter Reuther. If engineers do unionize en masse, then their critics are correct—they are trained, not educated.

JOHN P. MURRAY
Corps of Engineers
Albuquerque, N. M.

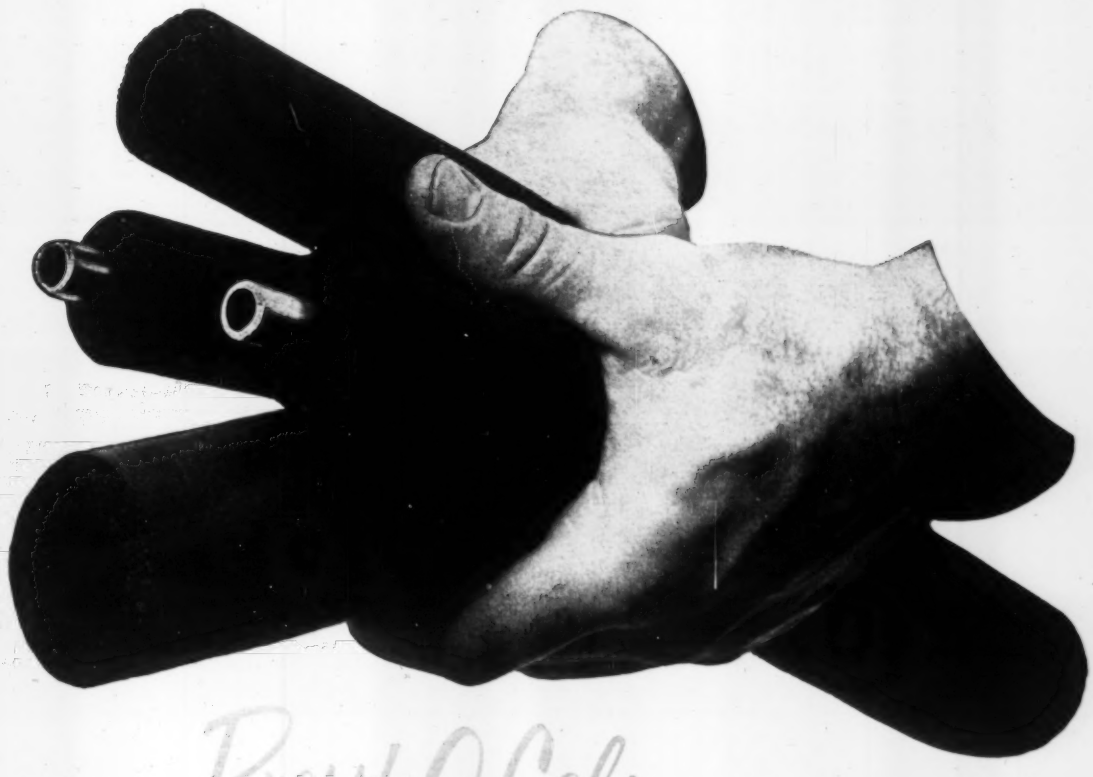
▶ Sir—Congratulations on including the views of engineering union leaders in "Engineering Unionism Faces a Time for Decision" (ENR Apr. 23, p. 30). Rarely do we hear labor's side.

Organized labor provided me with wages sufficient to finish my university training. This is the first published word of their position that I have seen that wasn't paid for by labor funds.

FRANCIS G. YATES P.E.
Las Vegas, Nev.

(Reader Comment continued p. 15)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



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the new closed-cell insulation that's self-extinguishing...stops "sweating"...is watertight!

PRESST-O-CEL's low "K" factor protects against condensation and heat loss. It provides a vapor barrier and will not support combustion—that's the work record of new PRESST-O-CEL, the closed-cell insulation for protecting tube and pipelines on comfort conditioning and refrigeration installations.

Millions of tiny expanded cells are filled with inert gas—with the result that new PRESST-O-CEL is lightweight and flexible, yet ruggedly durable. For example: it is resistant to oils, acids, alkalis, fungus, rodents and vermin . . . is water and air tight. For the best—and longest lasting—installation, always specify PRESST-O-CEL.

MORE INFORMATION on this amazing new insulation on request
WRITE Dept. B-14.

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AMERICAN-MARIETTA COMPANY

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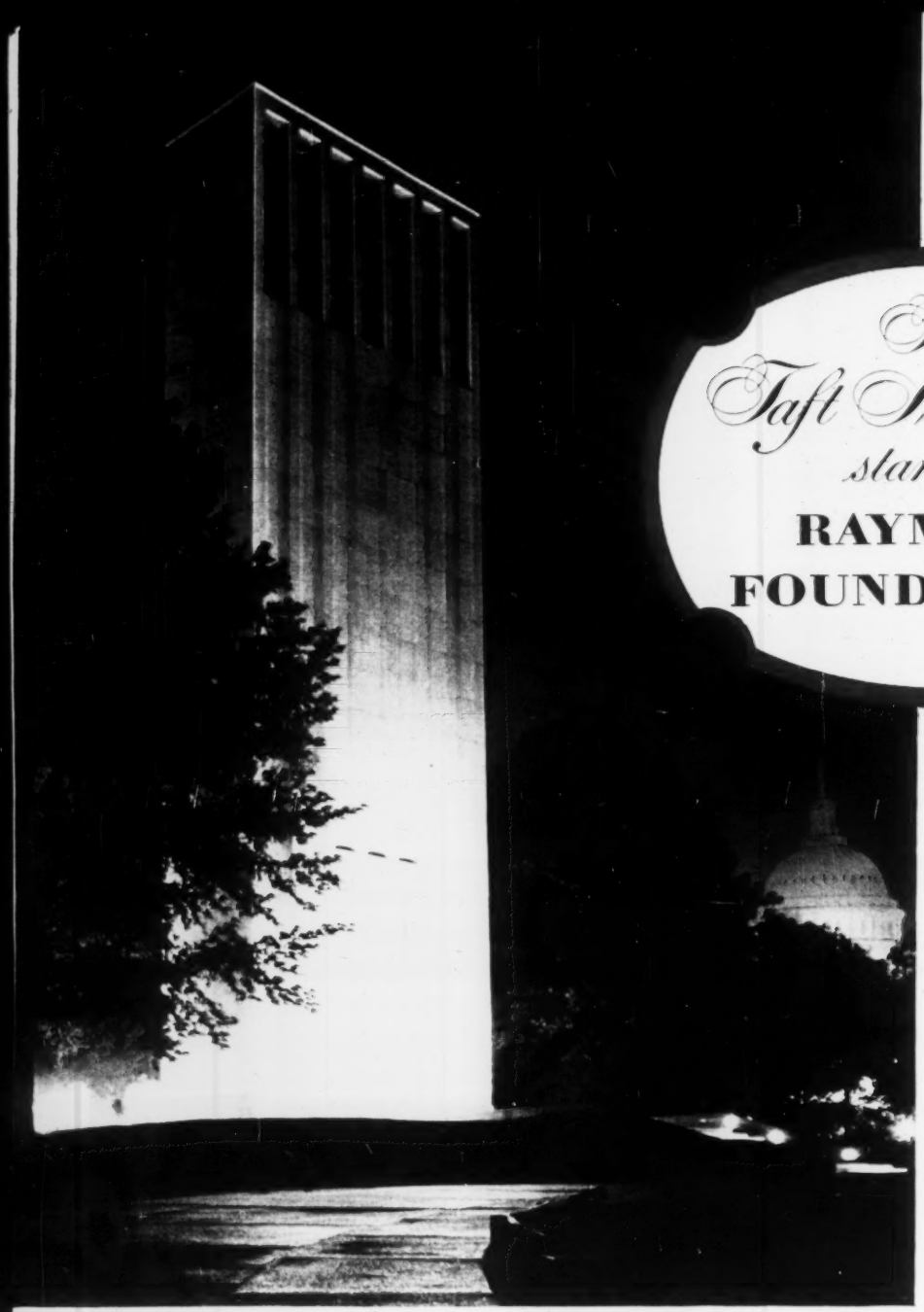

The Taft Memorial stands on RAYMOND FOUNDATIONS

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CONTRACTOR
Chas. H. Tompkins Co.
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Raised in honor of a great American, this 100 foot high carillon tower was recently dedicated in Washington, D.C. to the memory of the late Senator Robert A. Taft. Contributing to the permanence of the monument is a foundation by Raymond. We are proud of our part in its construction—a project exemplifying the versatility and scope of Raymond's abilities. Our engineers and crews are equipped to handle foundation work, large or small, in any area of the world. May we be of service?

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CONCRETE PILE COMPANY

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To head the class in concrete construction you have to be a letterman today. The letters: WRDA and DAREX AEA . . . symbols of concrete quality!

REDUCE WATER with WRDA and gain all the benefits of a low water/cement ratio. You end the problems of watered-down concrete . . . . yet mixes flow as smooth as country cream, compressive strengths zoom up as high as 25%.

ADD AIR with DAREX AEA, and a billion little air bubbles spread instantly through the mix, lubricating it for smoother, faster placement. As the concrete hardens, these bubbles guard against frost damage and cracking, even with repeated exposures to freezing and thawing.

You too can be a letterman. Use WRDA and DAREX AEA; a concrete combination that spells out a solid future.

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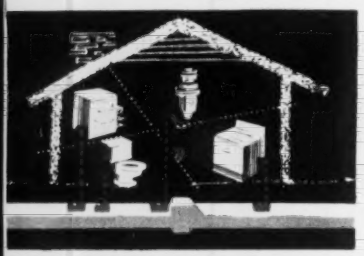
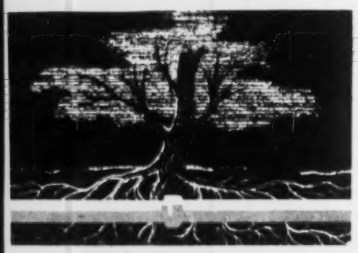
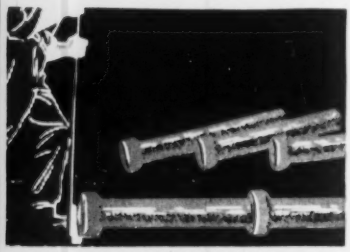


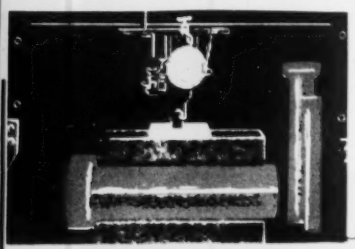
ACID RESISTANT—The interior surface of Amvit Jointed Clay Pipe cannot be harmed by sewage, chemicals, or hot liquids. Competitive materials cannot make this statement.



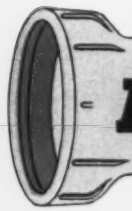
ROOTPROOF—Amvit is a compression type joint on the ball and socket principle. When the joint is made nothing can enter the line.



SPEEDS INSTALLATION—Amvit Joint is a true mechanical joint. The joint is on the pipe delivered to the job site ready for immediate installation.



STRONGER—Amvit joint is pliable, permitting reasonable deflection without leakage. It is resilient to absorb shocks or vibrations that might cause failure in a more rigid type of joint.



Amvit Jointed Clay Pipe proved

The Factory-made Plastic Mechanical Joint for quick low-cost installation

Never before has a product gained immediate and wide acceptance and usage in such a short period of time. In the past few years over 100,000 miles of Amvit Jointed Clay Pipe have been installed across the country with outstanding results.

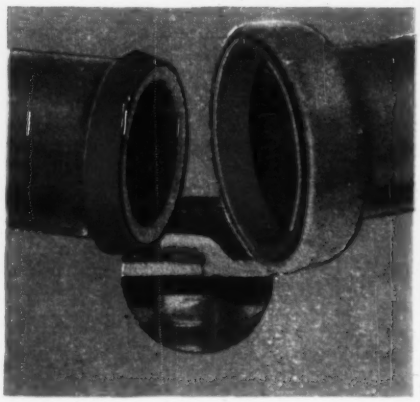
The AMVIT Joint is manufactured from plasticized resins of polyvinyl chloride. No other combination of materials is used or needed. It is applied on the pipe at the factory by a special manufacturing process and is delivered to the job site ready for immediate installation. No special tools or equipment are needed and the line can be installed in the most severe weather.

The design of the Amvit Joint is based on the ball and socket principle. The material on the spigot end is a convex shape, with the bell end in a concave shape. This permits easy and rapid installation.

When the joint is made, it reaches maximum compression which results in a really tight line. Thus preventing infiltration, exfiltration and root penetration. A large savings in both pumping and treatment plant costs can be achieved.

The design of the Amvit Joint assures self-centering which gives a smoother invert and better flow characteristics. This, in turn, results in a trouble free line with less maintenance and repair.

Due to the tightness of the joint, no foreign matter such as sand, stones or dirt can enter the line. This permits a larger capacity in the pipe for transmittal of sewage alone. Since infiltration is practically eliminated, the sanitary sewer does not have to carry anything other than that for which it was designed. This feature permits the use of smaller sized pipe in many instances and will reduce the material cost.



FOOLPROOF JOINT—Amvit Joint is a true mechanical joint made from plasticized resins of polyvinyl chloride. It is a compression type joint on the ball and socket principle. When the joint is made, the surfaces of both bell and spigot rings are in constant high compression.

For more information on how Amvit can help cut your sewer project costs, write or call American Vitrified Products Company, at our office nearest you.

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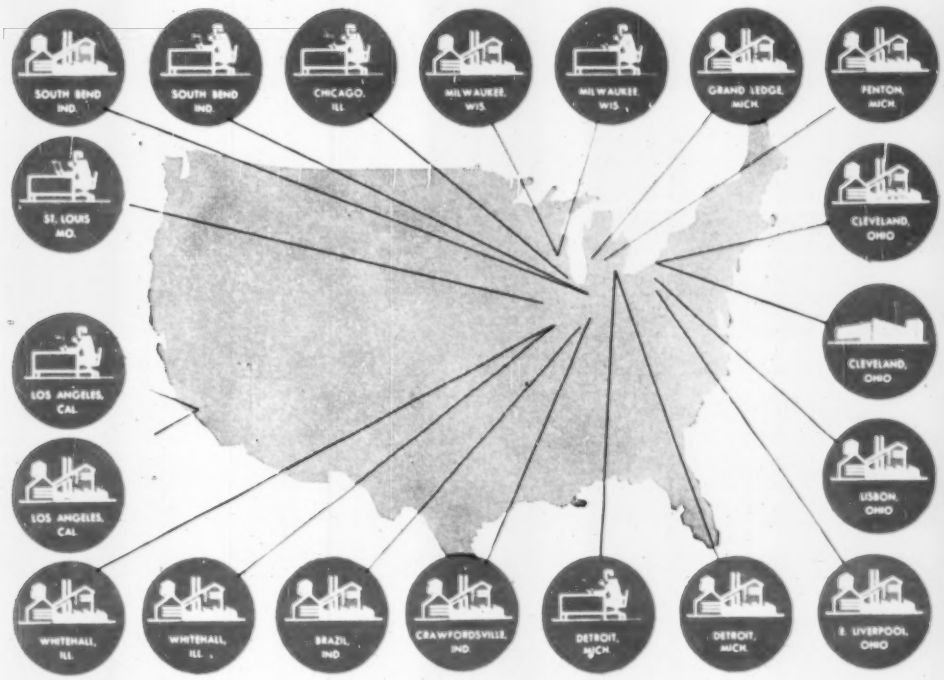

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Since 1848

AMERICAN

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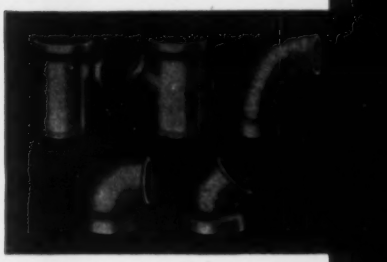
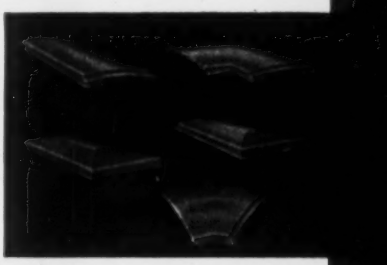


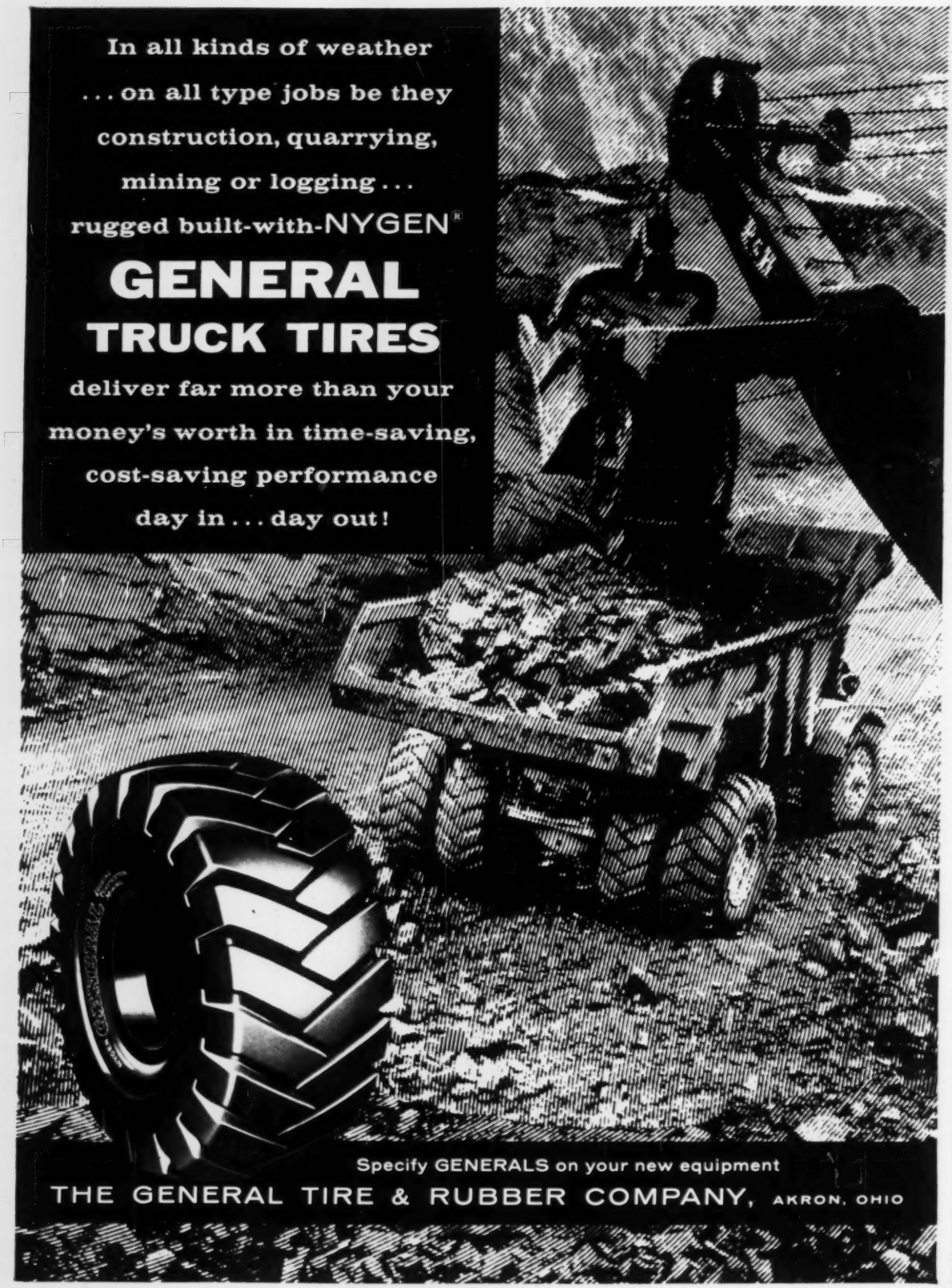
FITTINGS—More than 35 different fittings are available with or without the Amvit Joint. There are fittings to solve every problem.

FLUE LININGS—American's flue linings conform to A.S.T.M. specifications and are available in all sizes and dimensions.



WALL COPING—American produces four styles of wall coping to suit any architectural needs. Easily installed, the coping virtually becomes part of the structure.

LINER PLATES—Curved liner plates will protect concrete pipe from corrosion. They are used on pipe 36" to 144" diameter. Flat liner plates are used in box culverts, abutments and wherever abrasive action is encountered.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THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO

Matter of Degrees

Sir—The article, "Building Parking Space for Boats," (ENR Apr. 2, p. 82) is quite interesting.

But I stopped short when I caught the phrase, "boating seasons range from two or three months in New England and the Northwest, to almost a full year in such areas as Florida and Southern California."

Possibly this is merely a matter of defining the word Northwest. We find, to many Easterners, the Northwest is the land around Wisconsin and Minnesota. Boating is shorter in this area where winters are extremely cold.

However, if by Northwest, you mean the more specific definition of Oregon, Washington and Idaho, I believe you will find that boating is more a six to eight months sport than it is two to three months. I often have trouble convincing Eastern friends that many winters here in the Northwest, we do not have snow and the temperature does not go below freezing.

JOHN M. HAYDON
Publisher
Western Marine Dealer

In the Navy: Engineer

Sir—This refers to the editorial, "Civil Engineering's Place" (ENR May 7, p. 1161). If I may, I would like to call your attention to the fact that it is the Navy's "Civil Engineer Corps," and not "Civil Engineering Corps."

WERNER AMMANN, CDR, CEC, USNR
Ammann & Whitney
New York, N. Y.

For Your Calendar . . .

Symposium on Plastic Design in Steel, Queen's University at Kingston, Ont., Canada, June 15-19. Write Dr. H. W. Curran, Director of Extension, Queen's University, Kingston, Ontario.

American Society of Engineering Education, University of Pittsburgh and Carnegie Institute of Technology, Pittsburgh, Pa., June 15-18. Write W. Leighton Collins, American Society for Engineering Education, University of Illinois, Urbana, Illinois.

National Society of Professional Engineers, Annual Meeting, Commodore Hotel, New York City, June 17-20. Write C. T. Butcher, NSPE, 2029 K St. N. W., Washington 6, D. C.

American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26. Write ASTM, 1916 Race St., Philadelphia, Pa.

Waste Disposal in Marine Environment, First International Conference, University of California, Berkeley, Calif., July 22-25. Write Director of Conferences, University Extension, University of California, Berkeley 4, Calif.

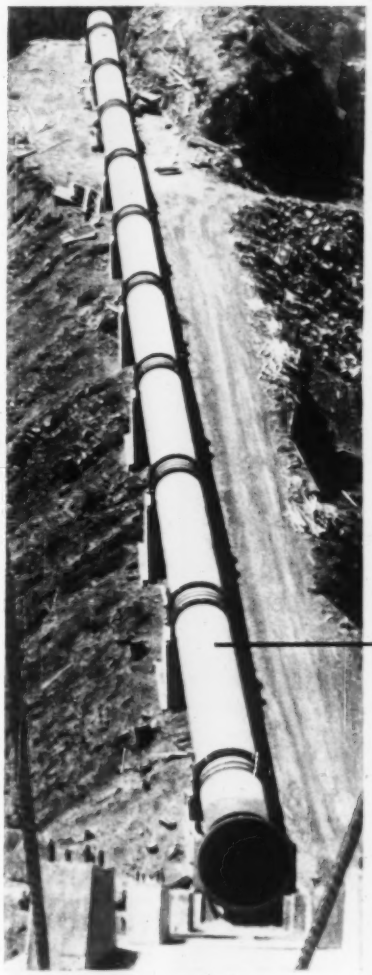
American Institute of Architects, Annual Meeting, Roosevelt Hotel, New Orleans, La., June 22-26.

Illuminating Engineering Society, Great Lakes Regional Conference, Hotel Lafayette, Buffalo, N. Y., June 22-25. Write Lee H. Mentzer, IES, 345 Washington St., Buffalo 2, N. Y.

Air Pollution Control Association, Annual Meeting, Hotel Statler, Los Angeles, Calif., June 21-26.

Asphalt Institute Mid-June Meeting, Hotel del Coronado, San Diego, Calif., June 24-25.

American Association of Cost Engineers, Annual Meeting, Carnegie Institute of Technology, Pittsburgh, Pa., June 24-26. Write Edward D. Shanken, U. of New Hampshire, Durham, N. H.



Each Dresser Coupling is engineered to meet the pressure at each portion of the penstock

CALIFORNIA OREGON POWER COMPANY . . . another 100% Dresser-Coupled penstock

Near Yamsay, Oregon, you'll find another impressive argument for using steel-pipe penstocks and Dresser Couplings. The line is 100 percent Dresser-Coupled . . . the only type of joint which could be individually tailored to the pressure-requirements at each portion of the penstock.

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The Dresser method saves money by permitting the use of lighter wall, high tensile steel pipe. Weight savings can amount to 25 percent . . . resulting in lower freight and handling costs, lighter equipment on the job. There are no fussy lining-up operations. The flexibility of the Dresser Coupling compensates for slight misalignments caused by grade variations. With the Dresser method, you get a stress-free line, bottle-tight for life.

If you'd like to see technical data on a number of other Dresser-Coupled penstock installations, write for illustrated brochure. Before you draw up specifications, make sure you have all the facts on steel pipe joined with Dresser Couplings.

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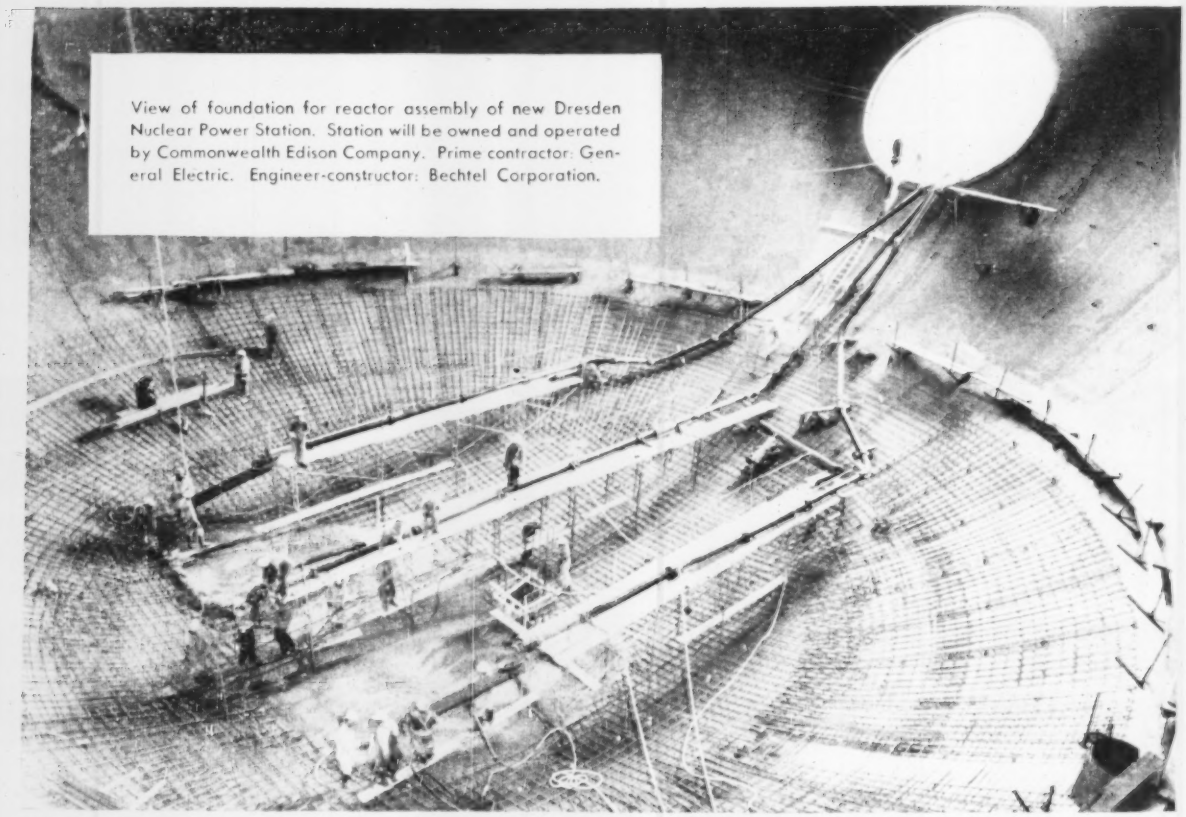

View of foundation for reactor assembly of new Dresden Nuclear Power Station. Station will be owned and operated by Commonwealth Edison Company. Prime contractor: General Electric. Engineer-constructor: Bechtel Corporation.

2850 tons of re-bars from Ryerson in nation's largest all-nuclear power station

Aerial view of Dresden Nuclear Power Station. About 75% completed, it will have a net electrical capacity of 180,000 kw.

The huge, new Dresden Nuclear Power Station, located southwest of Chicago, is the largest under construction in the country. The foundation and shielding alone for the nuclear reactor assembly contain 22,000 cu. yd. of concrete, reinforced with re-bars from Ryerson.

On major projects like this—or those that require only a few tons—rely on Ryerson. Ryerson offers unequaled stocks and fabricating capacity to keep pace with any job . . . provides setting plans . . . tags steel for positive identification . . . delivers on schedule—exactly as your job requires.

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ENGINEERING NEWS-RECORD

Vol. 162, No. 23 June 11, 1959

Number of copies printed this issue 85,030

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THE CONSTRUCTION WEEK

AVOIDING SKIN TROUBLE—Metalworkers are back on the job this week installing curtain walls on Union Carbide Corp.'s 52-story headquarters in New York City. They held off for five weeks while the exterior wall panels were put through special performance tests. The panels were developed by Union Carbide. They're blackcoated stainless steel, with an asbestos honeycomb and aluminum backing, held together with an epoxy adhesive.

BUDDING BASES—West Coast Congressmen have told constituents the Air Force will build a $46-million Titan ICBM base at Larson Air Force Base, Wash., and a $5-million Bomarc antiaircraft missile base in Solano County, Calif., near Dixon.

BIG DAM START—Work began last week on the largest irrigation project ever undertaken in Canada—the South Saskatchewan River Dam. The new dam will be three miles long, cost $184 million, impound 8 million acre-ft of water, supply power to the main cities of Saskatchewan, take 6 to 10 years to complete and eventually irrigate 500,000 acres of what is now marginal land.

NEW MATERIALS TAX—Florida contractors bidding on public works will have to figure in a 3% tax on building materials used on public projects. The tax goes into effect July 1. The state and municipalities will also have to consider the tax when planning bond issues for public works.

BIDS ON HIGHEST ROCKFILL—With a figure of $23,985,364, Merritt-Chapman & Scott of New York City beat out 13 other bidders last week on construction of Cougar Dam, on the South Fork of the McKenzie River, near Eugene, Ore. High bidder quoted $34.9 million. The Corps of Engineers estimated $26,166,810. Bids covered construction of the dam and outlet works, power intake works and a short section of road. Later bids will cover construction of a 25,000-kw powerhouse. Cougar's 445-ft height will make it the highest rockfill dam ever built.

A UNITED FRONT—St. Louis this week becomes the first U.S. city to set up a cooperative program between construction labor and management, patterned after the recently formed national Construction Industry Joint Conference. Composed of building trades unions, general contractors and specialty contractors, the new group hopes to preserve and extend contract construction.

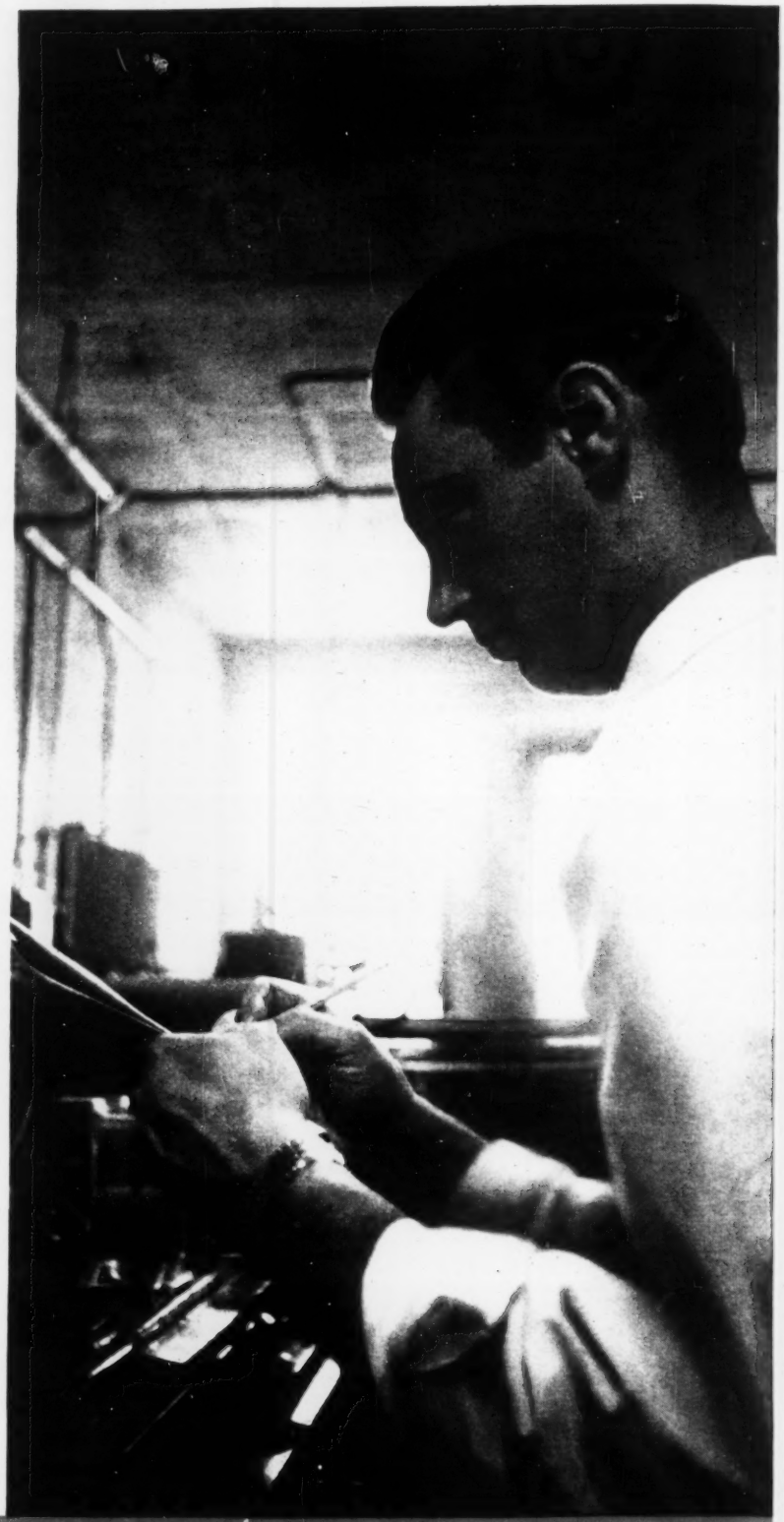
MULTIPLICATION—There's no end to the need for school construction. Now the Census Bureau reports the number of school-age children will rise 21%, to 48.8 million, by 1963.

HERE'S HOW ESSO RESEARCH CAN GO TO WORK FOR YOU

The Esso Lubrication Engineer brings to your shop the vast experience and facilities of Esso laboratories and research—as a customer service.

He offers, with a broad knowledge of fuels and lubricants, considerable experience in the maintenance of equipment like yours. For instance, he can trouble-shoot cases of rapid wear and frequent overhauls . . . point out instances where too much lubrication is wasteful . . . where too little—or the wrong kind—results in unnecessary wear. And if you have an unusual problem, he can have it analyzed in one of the conveniently located Esso Sales Service Laboratories—capable of running over 500 different kinds of petroleum product tests.

Let an Esso Lubrication Engineer help *you* cut maintenance costs. For more information, contact your nearest Esso office, or write to: Esso Standard Oil Company, 15 West 51st Street, New York 19, N.Y.



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In industry after industry..."ESSO RESEARCH works wonders with oil"

WASHINGTON OBSERVER

- **Under investigation:**
  Consulting work done for Corps
  U. S. engineers with outside jobs
- **Transportation study bogs down**
- **Tight money: Little choice for Dems**

- **The Corps of Engineers' practice of farming out engineering work to private consultants is under Congressional scrutiny.**

  At issue: survey and design work, primarily. The House Appropriations Committee is wondering whether the Corps cannot do most, if not all, of the millions worth of such jobs that now are assigned under contract each year to consulting engineers.

  The committee has ordered an investigation. But it isn't taken too seriously. The lawmakers are relying chiefly on the Corps itself to report back on whether it has the manpower to do the work in question. If not, the House group wants to know if it would be less costly and more efficient to expand the Corps' own staff of survey and design specialists.

  No work now in process is jeopardized. Whatever happens won't be reflected in the Corps' operations for another year or so.

- **The Department of Justice is investigating a different, but related, problem—government engineers working for outside employers.**

  This now involves only Bureau of Reclamation personnel. One potential criminal investigation, on conflict of interest charges, is well advanced. Central figure is a Denver employee of the bureau, who—with his superiors' knowledge—took outside employment with a private firm of consulting engineers to do advanced engineering work on a city of Seattle project. Justice Department's interest stems from a law that makes it a criminal offense for any federal employee to accept outside payment for working on matters in which the U. S. has an interest.

  Reclamation has been quite lenient about this practice, but now is tightening up. Testimony given to Congress lately indicates there may be some cases where bureau people did "outside work" on projects that later came under Reclamation's official jurisdiction.

- **A Commerce Department study of the need for expanding transportation industries may never come off.** President Eisenhower, in his budget message last January, asked for a really fundamental report that would look into government subsidies to highways, ocean shipping, airlines—and recommend changes to "assure the balanced development" of these industries.

  The House refused to vote the $100,000 asked to finance the study. The hoopla over the consideration by Commerce Secretary Lewis L. Strauss of railroad financier Armand G. Erpf to head the study helped bog the project down.

- **Tight money and higher priced money**—That is the painful condition that goes along with the revival of the business boom. President Eisenhower made it clear this week when he asked Congress to raise the legal limit on the interest rate on government bonds, to increase the interest rate on savings bonds, and to raise the government's debt ceiling (see p. 90).

  Democrats are crying about the "big business" policies that, they say, make these demands necessary—but they're going to have to approve what the President has asked for.

NEED TO MOVE 3,000 YDS. PER SHIFT?

Whether your job is in construction or stripping as shown in this California operation, this big diesel Marion 111-M can make the dirt fly.

Here, its 3½ yard bucket on a 90-foot boom has chewed and moved 3,000 yards in an 8-hour shift.

Electric swing on this diesel-powered Marion, plus long wide crawlers that let it travel and work on any normal footing, make it ideal for many different types of work.

Ask your Marion Distributor for a 24-page catalog on this versatile, dependable machine.

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MARION POWER SHOVEL COMPANY - MARION, OHIO, U.S.A.

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Power shovels, hoes, draglines, clamshells, cranes - - crawler, rubber and walker mounted - - ¾ to 100 cubic yards

Wage Boosts Are Losing Steam

- **Settlements are giving union construction workers less this year.**
- **Long-term labor contracts are still popular. They'll tend to continue the downward trend in wages through 1961.**
- **Efforts to increase worker productivity may be paying off.**

Concern over mounting labor costs has begun to make an impressive dent on negotiated wage increases won by construction workers.

For the first time in several years, average wage gains have dropped significantly to 13.4 cents an hour, according to 1959 contract settlement reports received by ENR. The figure has ranged from 14.5 to 16 cents an hour in recent years.

The industry is passing the peak of its collective bargaining season.

The downward trend, which is accompanied by a marked increase in efforts to improve worker productivity, is also reflected in currently negotiated deferred wage increases.

If this trend continues for the rest of the year, the groundwork will be laid for even smaller wage increases next year, although the possibility of an upturn is indicated for 1961.

This change of pace is due to a host of factors.

A handful of wage freezes, use of a great variety of settlement figures (ranging from 5 to 25 cents an hour), and greater preference for 10-cent settlements have all conspired to pull the national average down, although some trades are still walking off with three-year package wage increases that hit as high as 65 cents an hour.

Fringe benefits, on the other hand, have continued to grow in number and cost. Emphasis is on vacation pay, pensions and health and welfare.

Little, however, has been accomplished in getting the building trades' work practices code, commonly known as the "Ten Commandments," adopted in toto. But some progress has been made in removing restrictions on the use of time-saving devices and in cutting the cost of travel pay, which are integral parts of the code.

All of this has taken place with relatively few strikes and lockouts—in only 11% of the reported bargaining situations did strikes precede settlements and in a number of these the main stumbling block was union reluctance to give up an exclusive hiring hall, rather than an economic issue.

This indicates two things:

- Many local unions are as concerned about the future of their job opportunities as contractors are.
- These unions do acknowledge the existence of a common employer-employee interest that may make such developments as formation of the industry's Joint Conference Board pay off.

• **Outlook on wages**—Those general trends should continue at least through 1961. That's somewhat assured by the continuing use of long-term contracts.

So far this year, 78% of the settlements are for two years or longer, with 44% of the contracts set up on a two-year basis and 22% for one year (see table). A four-year contract was reported in only one instance.

The significance of this, as far as basic rates go, shows up in the comparative sizes of newly negotiated present and deferred wage increases.

The average 1959 basic wage increase is 13.4 cents under both one-year and long-term contracts. (This is slightly below the average 1959 deferred wage increase effective this year under long-term contracts negotiated earlier.)

Deferred wage boosts under the new contracts, however, are lower. They average 13 cents for next year and 12.8 cents for 1961.

Two-Year Contracts Favored

One-year contracts	22%
Two-year contracts	44%
Three-year contracts	34%

Deferred Increases: A Bargain

First year increase (1959)	13.4¢
Second year increase (1960)	13.0¢
Third year increase (1961)	12.8¢

If the trends of the past continue, the 13-cent figure will serve as a floor of sorts for increases negotiated next year and should tend to hold them to levels lower than those achieved so far this year.

The third-year increase—an average of 12.8 cents—is higher, however, than the third-year increase negotiated last year. This raises the possibility that 1961 negotiations may slow down, halt or even reverse the present downward trend in basic wage increases.

• **Fringe benefits**—By the same token, the long-term contract pattern is tending to give several significant fringe benefit trends a sense of permanency.

Chief among the trends is a fairly widespread increase in the development of pension plans and new or more liberal holiday and vacation pay provisions—all of which still trail behind health and welfare plans in popularity. This year's bargaining has also so far showed a noticeable increase in employer contributions for apprentice training programs.

The other trend worth noticing is the preservation of some flexibility with respect to fringe benefits.

In a number of cases, unions have reserved the right to take future specified increases in basic wages or in fringe benefits at their option. A few have already swapped basic pay boosts either permanently or temporarily for fringe benefits, or vice versa; others have deferred the effectiveness of presently won benefits until next year.

Some progress has been made during the first five months of this year in lowering the cost of travel pay—usually by enlarging the free zones. But this progress is pretty well canceled out by the number of instances in which travel pay has been increased. In one instance, a union negotiator, resisting contractor efforts to cut travel pay, said, "We are not going to take a step backward—we are going up the ladder, not down."

New show-up time was reported in

Most Popular '59 Increases

Amount of Increase	Percentage Of Contracts*
15¢	34%
10¢	33%
12½¢	9%
5¢	6%
25¢	6%
20¢	6%
12¢	6%

*** Covers just 7 most popular amounts.**

only one case. Chicago electricians will get two hours' pay when bad weather prevents them from working after reporting, unless notified not to report before leaving home.

The habit of negotiating fringe benefits in percentages of base pay (actually a permanent form of escalation) instead of in flat sums per hour was repeated again this year in some bargaining situations.

• **Contractor return?** Have contractors actually received anything new in return for these wage and fringe concessions they have granted?

The answer is "yes" but a softer one than management generally had hoped for. A spokesman for one employer group says the only thing he can pin his hopes on is that labor will be inspired to give a fuller day's work for the bigger pay envelope.

On the contractual rather than voluntary side, however, employers have scored these gains, partly as the result of the "Ten Commandments":

• Plumbers in Illinois' Cook County have agreed for the first time to drop restrictions on the use of power equipment and tools.

• Painters in Pittsburgh have accepted a new clause regulating the use of rollers to speed the painting of certain areas.

• Bricklayers in New Jersey's Essex County have worked out a flexible lunch hour that will permit masons to pour without interruption.

• Sheetmetal workers in Columbus, Ohio, have given up double time for time and a half for overtime on industrial projects.

• Plumbers and pipefitters in Minneapolis and St. Paul have increased the number and proportion of apprentices to journeymen.

• Carpenters in Philadelphia and sheetmetal workers in Detroit are participating in the establishment of new funds for advancing and promoting the interests of their local industries.

• Electricians in Chicago agreed to postpone the effectiveness of their new contract for six weeks to permit contractors to complete present projects under the old rather than the new pay scales.

• **Areas of little change**—The 1959 settlements concluded before the first of the month have failed to perpetuate an earlier trend of splitting yearly pay increases into two installments—a device that lowers the cost of an annual pay boost. This practice occurred in less than 7% of the reported settlements.

At the same time, the contracts show no further development in efforts to achieve uniform contract termination dates or off-season bargaining. In only one instance was there a departure from the anniversary dates of previous contracts.

Use of wage escalation clauses—now fairly dormant in construction—was also spotty. Carpenters and electrical workers in two Ohio regions won an escalation clause on top of a specified wage boost, and a painters local in Connecticut tied a deferred increase for 1961 to the cost of living.

Bargaining interest in a shorter workweek has been almost nil, despite the efforts of labor's top command to promote it. Electrical workers in San Diego stand alone in their efforts to roll the workweek back by four hours. This demand is coupled with one for a 50-cent wage boost to offset the income lost by shorter working hours.

• **Things to watch**—Two developments that may spread have already started:

• **There is a tendency to think of wage increases as adjustments rather than as automatic or accepted practices.** Different increases were granted, for example, to sheetmetal workers in St. Paul and in Minneapolis to "close the gap" between the previous wage scales. The same thing has been tried with various trades in parts of New Jersey. And in Youngstown, Ohio, carpenters are seeking to achieve wage parity with the highest of the hourly rates received by the local Building Trades Council.

The other development has occurred outside the area of collective bargaining, but it relates directly to it.

• **There is a contractor effort to perfect and improve management's bargaining position through a realignment of forces.**

Several builders' associations in upstate New York have already merged into a single, stronger and more effective employer association. A Northern California Home Builders Conference has been formed to serve the interests of five member associations. And the Northern and Central California Chapter of the Associated General Contractors has proposed formation of a Central Labor Committee to negotiate and administer labor contracts on behalf of AGC contractors, homebuilders and independent contractors in the area.

Juggling

The public works appropriations bill for fiscal 1960, now being steered through Congress with a delicate touch, points up the great political juggling act that preoccupies Washington these days.

In acting on this money measure, vital to the construction industry, the House broke President Eisenhower's policy of "no new starts" without breaking his budget.

In this context, the Appropriations Committee, under the cagy chairmanship of the veteran Clarence Cannon (D., Mo.), has just finished one of the better juggling performances of the session to date.

President Eisenhower asked $1,185,406,259 for fiscal '60 in the regular public works appropriations bill. Mr. Cannon's committee took the measure to the House floor for passage carrying precisely that sum.

This "balance" presumably will make the President happy. But to put the voters back home in the same frame of mind, the committee threw in a bonus—a bundle of 38 new construction starts and of 12 more projects for which it ordered planning to begin (see tables).

Of the new starts, 31 are Corps of Engineers projects. Initial appropriations voted by the House committee for these are $25.3 million; ultimate completion costs will be about $347 million by current estimates. The remaining seven, under jurisdiction of the Bureau of Reclamation, get $5.7 million initial appropriation and are estimated to cost nearly $100 million ultimately.

Planning funds for the 12 new projects (see table) amount to about $1.4 million in the coming year. This is money to advance engineering design for the projects, which ultimately will cost $290 million to build.

To compensate for new starts and new planning while staying inside President Eisenhower's original budgeted figures, the committee made some cuts elsewhere. It reduced by about $25 million the funds for a variety of projects already under way, thus covering the large bulk of the $32.4 million it wrote in for unbudgeted construction work.

The new starts, the committee report said, "are in response to an overwhelming bipartisan rejection of the Administration's 'no new starts' policy as evidenced in the hearings." The committee said rigid adherence to the Administration policy would create some striking absurdities and would "ultimately dry up the water resources program of the nation." It also noted that the White House itself had backed down somewhat by permitting the Corps of

Public Works to Get New Starts

Engineers to transfer some funds for planning future projects.

Past history suggests that the Senate, which has yet to act on public works appropriations, will be more lenient. It is expected that, at a minimum, the Senate will want a modest expansion of the House's list of new starts.

The House committee turned down six projects the Administration requested, adding up to final estimated costs of $151 million. It refused four Corps of Engineers projects and also called for a temporary halt in construction of the Florida Intra-Coastal Waterway. The Bureau of Reclamation was denied funds for starting the Prosser Dam of the $50-million Washoe Projects in Nevada and the $25-million Ainsworth unit in Nebraska.

Corps of Engineers construction gets a total of $658 million in the bill, up $50 million over fiscal 1959. The House bill's total for all Army civil functions is $863 million.

Reclamation's construction funds add up to $208 million, down $6 million from this fiscal year, but sufficient, nevertheless, to cover the seven new starts. For all its operations, the bureau would receive $253 million.

Other major sections of the bill would give $22 million for construction to the Bonneville Power Administration and $15 million for the Tennessee Valley Authority.

Elsewhere in Congress:

• The Joint Atomic Energy Committee, in a bow to the Administration's economy campaign, reported out an authorization bill totaling $165.4 million for new plant acquisition and reactor construction. This sum, covering both military and civil projects, is $50 million more than the Administration wants but far under the totals Democrats were talking about when this session of Congress opened. And it is less than half the amount authorized last year.

• Early this week the House was set to pass the Blatnik bill, doubling to $100 million the annual authorization for municipal sewage treatment plants and likewise doubling to $600,000 the maximum federal grant for any single project. It appears doubtful, even if the bill passes the Senate, that it could survive a likely Presidential veto.

• Conferees planned meetings this week on both the airport and housing bills, different versions of which have passed both House and Senate. The final Congressional version of the airport bill will be close to the President's $63-million request for fiscal 1960, but considerably higher for future years.

What Ike Asked, and What He Got

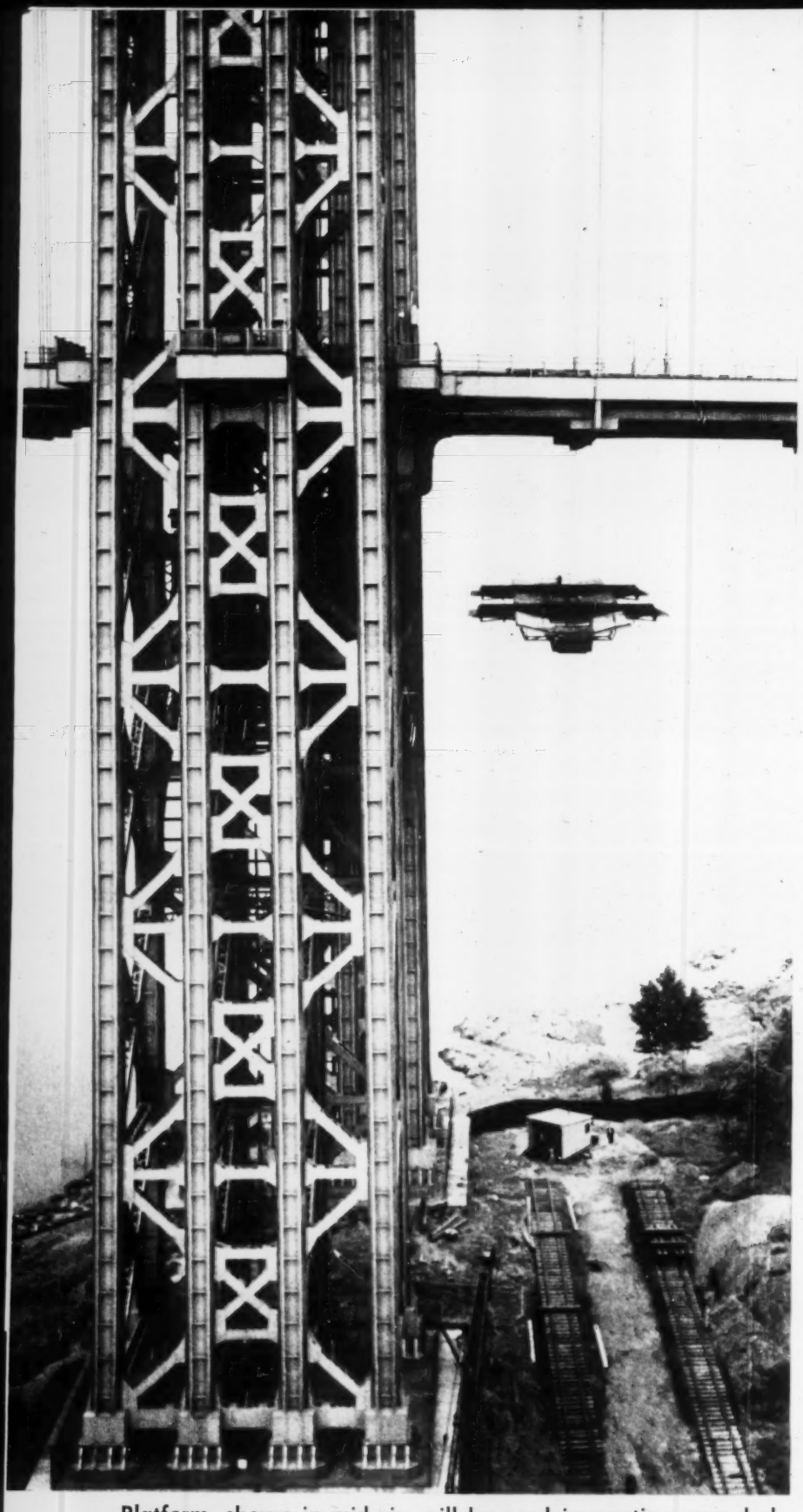
(Projects over $2.5 million) Corps of Engineers	Asked	Committee Voted
	(add 000)	
Dardanelle Lock & Dam, Ark.	$5,000	$3,400
Sacramento R. Ship Channel, Calif.	7,500	6,500
Calumet-Sag Channel, Ill.	8,600	7,670
Missouri R. Channel	6,420	5,600
Buckhorn Res., Ky.	3,527	3,027
Greenup Locks & Dam, Ohio R.	10,265	9,265
Markland Locks & Dam, Ohio R.	11,627	9,827
Cougar Res., Ore.	9,700	9,000
Kettle Creek Res., Pa.	2,500	1,900
Big Bend Res., S. D.	2,600	2,000
Sutton Res., W. Va.	4,417	3,417
Delaware R., N. J.-Penn.	13,500	12,500
Jackson Lock & Dam, Ala.	8,150	8,000
Bureau of Reclamation		
Central Valley, Calif.	$42,500	$42,150
Ainsworth Unit, Neb.	2,000	zero
Transmission Line Construction	15,508	14,953

These Are Construction Starts Ike Didn't Want

Corps of Engineers	Total Estimated Federal Cost	Committee Voted
	(add 000)	
New Hogan Res., Calif.	$19,300	$1,500
Red Rock Res., Iowa	71,400	1,113
Council Grove Res., Kan.	12,700	300
Barren River Res., Ky.	23,500	1,000
Hudson R. 32-ft deepening, N. Y.	36,300	500
Shenango R. Res., Pa. and Ohio	28,000	500
Proctor Res., Tex.	17,100	300
Pound Res., Va.	17,700	2,500
Summersville Res., W. Va.	46,800	2,000
Mad River Res., Conn.	5,970	275
Hunt, Lima Lake Drainage Dist., Ill.	5,420	1,000
Westville Dam, Mass.	7,450	1,800
Two Rivers Flood-Control Project, N. M.	6,900	75
Wilkesboro Res., N. C.	8,350	1,000
West Branch Mahoning R. Res., Ohio	6,940	525
West Tennessee Tributaries, Mississippi R. Flood Control	8,400	200
Buffalo Harbor, Ohio St. Bridge, N. Y.	4,520	2,000
Bureau of Reclamation		
Chief Joseph Dam Project, Wash.	$7,579	$724
Cedar Bluff Unit, Kan.	18,313	700
East Bench Unit, Mont.	20,597	1,000
Red Willow Dam, Neb.	6,597	525
Smith Fork Project, Colo.	4,420	730
Hammond Project, N. M.	3,280	500
Seedskadee Project, Wyo.	37,885	1,554

. . . And Planning Starts He Didn't Want

(Projects over $2.5 million)	Estimated Total Cost	Committee Voted
	(add 000)	
Holt Lock & Dam, Ala.	$33,000	$150
Gillham Res., Ark.	10,100	80
Saylorville Res., Iowa	47,000	200
Marion Res., Kan.	7,540	25
Pine Creek Res., Okla.	15,400	80
Yaquina Bay and Harbor, Ore.	22,300	100
Matagorda Ship Channel, Tex.	11,300	150
Little Goose Lock & Dam, Wash.	139,000	450



Platform, shown in mid-air, will be used in erecting new deck.

This 45-ton work platform will be

New Deck

A 45-ton contraption of steel, wood and wire started crawling along the underside of the 220-ft-high deck of the George Washington Bridge last week.

The unit is the first of four beam-hung work platforms that will be used in adding a second deck to the 4,760-ft-long bridge across the Hudson River. From the platforms, thousands of rivet holes will be drilled in existing gusset plates and track beams will be strung beneath side-span deck stringers. The platforms will later become part of the permanent structure.

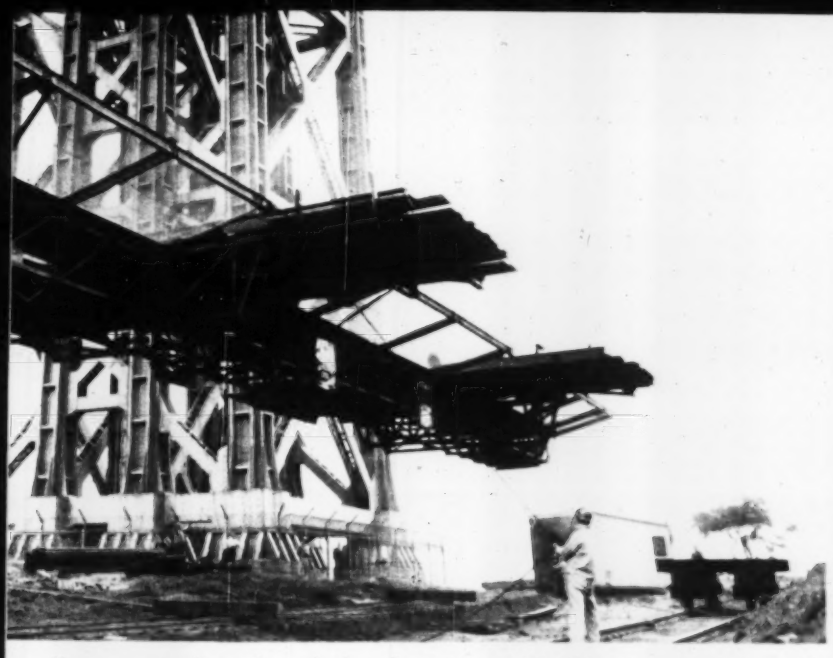
This method will make it possible to add the new deck without interrupting traffic on one of the world's most heavily traveled structures. Last year it carried about 40 million vehicles between New York City and New Jersey. The new deck will carry six lanes of traffic.

Total cost of the job, including tunnel work and approaches, will be about $185 million. The original bridge cost $76 million when opened in 1931.

One of the work platforms will be positioned on each side of the two bridge towers. The inshore ones will work towards the abutments, the outshore ones will work towards midstream and each other.

The platforms are 120 ft long, 14 ft wide and 8 ft deep. They travel under the existing bridge on track beams that are now an integral part of the platform. The rails will later be incorporated within the lower deck.

Here's how the platforms came about: Port Authority specifications require four traveling bridges for mainte-



roller-mounted under deck of George Washington Bridge.

Is Dealt Off the Bottom

nance and inspection to be suspended beneath the lower deck. Bethlehem Steel Co., which has the erection contract for the lower deck, needs working platforms. For the sake of economy it was agreed that the two would be one. The working platform pictured is an expanded inspection bridge; some of it will be removed after construction for its permanent job.

The platform now in use was assembled on the shore beneath the bridge and raised with a four-point lift by a cable. The cable worked through a sheave block hooked to a hoisting beam, mounted between stringers.

For the rigging, just running a line from the hoist to the bridge deck and down to the platform would have presented almost insurmountable problems in anchoring the hoist.

Instead the hoist was set off inshore from the tower and cabled to eyebolts set in rock. The hoisting cable was then run out horizontally to a block at the base of the tower. From there it went straight up to a block underneath the deck, then inshore horizontally to a multi-sheave block and finally down to the platform. This put the anchor bolts in shear instead of tension, and simplified the hoist anchorage problem.

With the cable-held platform up in position, workmen on it transferred its weight from the cable to four stringers of the upper deck. They did this by means of specially designed hangers. The hangers are firmly attached to the stringers but, at the bottom, carry a double set of 6-in. wheels to engage the top flanges of the platform's track.

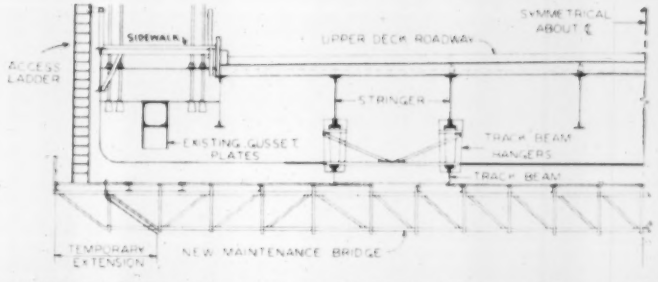
The platform is then free to be winched ahead on the hanger wheels as work progresses. With each movement forward, men at the front end attach additional hangers to the stringers.

On the platforms beneath the main span, the rear hangers are removed and put up ahead as work progresses. On the sidespans, however, the hangers are left in place. Here's the reason: Under the main span, barges carrying partially fabricated truss and deck sections can be accurately spotted beneath the point of erection, and the lift can be made through a trolley mounted on the floor beams of the upper deck. Under the sidespans, though, the space is limited and the terrain is rough. The fabricated sections can be raised only from a track set near the towers. After being raised, they must be rolled sideways into position. This calls for a track rail.

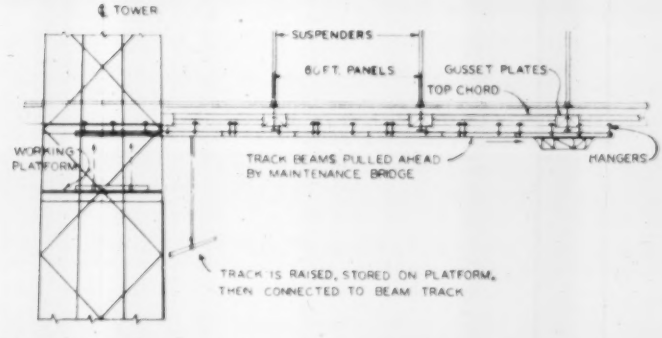
As the platform moves away from the tower, the extra track rail is fitted into the hangers adjacent to the tower and is attached to the beam carrying the platform. As each extra section of beam clears the tower, another is tacked on behind. As the platform moves, it pulls the extra track rail behind it.

When the rivet holes are all bored and the gusset plates cleaned, the working platforms will be lowered away from the bridge deck so that truss erection can begin. The main span platforms will be lowered to barges in mid-river. The sidespan units will be lowered to the bottom flanges of the track rail, rolled back to the tower, then cabled to the ground.

Work on the bridge is under the direction of Henry A. Druding, resident engineer for the Port of New York Authority, and C. E. Adams, erection superintendent for Bethlehem Steel Co.

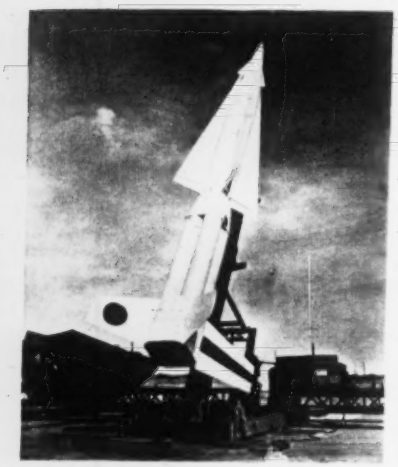


HOW IT'S HOOKED UP – Maintenance bridge has built-on track beams that ride on rollers suspended below existing bridge deck.



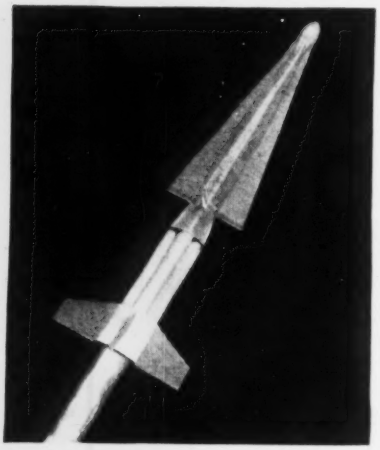
HOW THEY OPERATE – Workmen on maintenance bridge drill holes in gusset plates at panel points. New track beams are placed behind work bridge as it travels.

Missile Construction Waits as



OUT: Nike-Hercules
No more funds likely

CUT: Bomarc
Funds will be scaled down



COMING: Nike-Zeus
But big spending is years away

The furor over the continental air defense program is coming to a head. Under pressure from Congress, the Pentagon is taking a long hard look at plans for construction of bases for the two rival antiaircraft missiles, the Army's Nike-Hercules and the Air Force's Bomarc.

Sometime next week or so, results of the latest assessment of air defense construction plans will be reported to Capitol Hill. But the implications for construction are already clear.

Millions of dollars worth of military construction business, initially scheduled for award over the next 18 months, will now be killed.

As Pentagon insiders see it, the decision will halt construction of new Nike-Hercules bases and scale down plans for Bomarc installations.

The decision has been forced by two recent Congressional actions:

- The Senate Armed Services Committee tied up $50 million appropriated last year (but still to be contracted out by the Army) for construction of 25 Nike-Hercules sites in the continental U.S. and facilities for eight batteries in Hawaii. At the same time, the committee sliced the Army's request for authority to build $22.4 million worth of new bases during fiscal 1960 (starting July 1) to $5.1 million.
- The House of Representatives cut the Air Force's $447.3-million appropriation request for production and testing of Bomarc by about one-third.

The measures were taken against a backdrop of long-simmering, interservice disputes over the merits of the two missiles.

Similarly, Air Force spokesmen have made no bones about their skepticism over the Nike-Hercules' value.

Behind all the squabbling and spending is this bitter irony: Both missiles, after long years of development and heavy expenditures, have become obsolescent just as operational deployment has gotten under way.

This is similar to the situation with our intercontinental missile program. The Atlas ICBM isn't operational yet. But we're constructing Titan bases that are more advanced than the Atlas, and planning Minuteman bases that will obsolete the Titan (ENR Apr. 23, p. 25).

Nearly $3.7 billion has been spent on the Nike project since 1945—for research, development, production, and other costs, as well as construction. This sum covers work on the 25-mile-range Nike Ajax. Development of the longer-range Nike-Hercules (50-100 miles) started in 1953; the Hercules became operational just last year.

Total cost of the Bomarc program up to now runs to about $1.9 billion. Production began in 1957 after about 12 years of design work on a pilotless interceptor missile.

Critics such as Senators Stuart Symington (D., Mo.) and Henry Jackson (D., Wash.) argue that the present air defense system is geared to fight off an attack only by manned bombers. They feel that the threat of a bomber attack has now diminished and that the ballistic missile—against which no effective defense seems likely in the near future—is the overwhelming danger.

Another critic of air defense policy, Vice Adm. John T. Hayward, the Deputy Chief of Naval Operations, believes both missile projects will soon be obsolete and argues that work on them be halted.

As these critics see it, defense funds now earmarked for air defense should be diverted instead to greater procurement of offensive striking weapons.

The Pentagon's official line concedes the growing ballsitic missile threat, of course, but holds that defenses against manned bombers will still be needed for the next few years.

The emotional competition between the Air Force Bomarc and the Army's Nike-Hercules results in part from Washington's tough hold-down on the military budget.

The competition also represents a basic difference in air defense philosophy between the two services. The Army's theory calls for building missile bases close to major target cities. The Washington-Baltimore area, for instance, is ringed by some 20 Nike sites.

The Air Force is skeptical about what it calls "last ditch" defense near the target and seeks interception and destruction of enemy aircraft well out from the target. Air Force strategists claim they could defend the entire continental U. S. with 40 carefully spotted Bomarc bases.

Under present Pentagon policy, there's a compromise between the two philosophies. Both missiles fit into the "defense-in-depth" plans now in effect: the Bomarc to provide far-out protection and the Nike for inner-ring protection against enemy planes that crack through the Bomarc line.

As the antiaircraft missile base plans shape up now, 288 Nike batteries have been spotted around the nation (about 3,456 launchers). Thirty-nine of the batteries, now set up at 62 sites, are equipped with the newer and longer-range Nike-Hercules.

The Army's plans have called for continued conversion of the old Nike-

Experts Debate Strategy

Ajax sites into Hercules installations. Construction costs for conversion amount to some $200,000 per site (excluding costs for missiles and supporting electronic facilities).

The Army also has been about to begin construction of new Nike-Hercules installations—average construction cost is $2 million per battery—around Air Force bomber bases.

The current Bomarc program covers construction of 19 bases. Four are under construction now; contracts on 10 more are set for award this summer. Cost: about $12 million each.

Planning for the five other Bomarc sites previously authorized by Congress is still to be completed. The fiscal 1960 budget provides funds for construction of five more—or a total of 24. This amount already represents a reduction from the 40 planned by the Air Force in 1956 and now may be reduced some more. The first Bomarc base will be operational this fall.

The Army's thesis in all the squabbling is that the Nike-Hercules is already in being—at a time when the bomber threat is still serious—and that the Bomarc is still some time off. The later Bomarc bases are not scheduled for operation until 1962-1964.

Last spring, when the Pentagon showed Congress latest plans for Bomarc and Nike-Hercules base construction, some defense experts claimed the plans showed considerable duplication of coverage—notably around Air Force bomber bases. So Congress combined the Army Nike-Hercules and Air Force Bomarc construction budget, cut the total by 20%, and assigned the combined budget directly to the Secretary of Defense—directing him to choose between the two missiles.

This action resulted in the Army's delay in awarding construction contracts on the Nike-Hercules bases authorized last year.

Plans to place anti-aircraft missiles in the U. S. heartland have dismayed many critics of the Pentagon's air defense policy. They believe the fall-out from the nuclear-tipped Bomarc and Nike-Hercules missiles could be almost as dangerous as the enemy's own explosives. In addition, they fear the risk of knocking down U. S. bombers taking off or coming in at Strategic Air Command Bases.

Some of the current criticism boils down to a axiom that the best defense is a strong offense; that instead of spending money on an air defense system that provides only marginal protection, a stronger deterrent to enemy aggression should be built by producing more missiles and bombers.

While all the controversy rages over Nike-Hercules vs Bomarc, an important side issue has developed over our defense against the enemy's ICBM.

One part of the anti-missile defense is to detect and warn of oncoming missiles. The Air Force's Ballistic Missile Early Warning System (BMEWS), now under construction, will provide the warning—about 15 minutes, or enough time (the Pentagon believes) to get U. S. bombers off the ground in order to launch a retaliatory attack upon the enemy.

Two BMEWS sites are going up—at Thule, Greenland, and Clear, Alaska. Total construction cost: close to $400 million. A third site is proposed near Preswick, Scotland.

But BMEWS is only a "passive" defense. The "active" defense—that is, an effort to intercept and destroy the oncoming missile—is represented by the Army's controversial Nike-Zeus anti-missile system now under development.

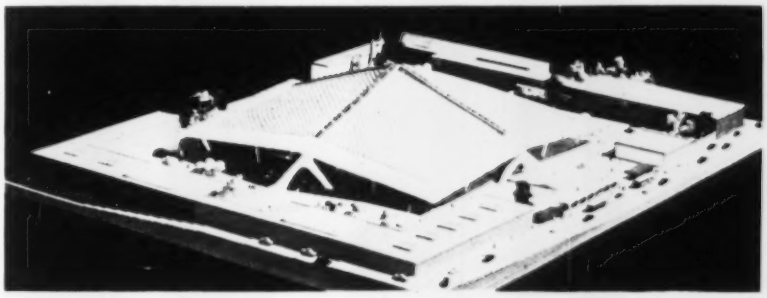
In some ways, Nike-Zeus is patterned after the earlier Ajax and Hercules. But the technology of the anti-missile missile is about as advanced from the anti-aircraft missile as a rocket powered airplane is from the most primitive prop-driven aircraft.

The Nike-Zeus is a top-secret project—very few details have ever been released. But it's known that the missile system will be based—like the Nike-Hercules—close to the target area. The anti-missile missile will have a range of 200 miles and is designed to destroy or neutralize the oncoming missile's nuclear warhead during the warhead's re-entry into the atmosphere.

The Air Force has criticized Zeus's range as too limited to provide an adequate defense. It has a competing research project, Wizard.

When and if the Zeus ever reaches production, there will be a massive requirement for new base construction. Zeus cannot be set up at converted Ajax or Hercules facilities.

But the Pentagon's consensus is that it will be many years—estimates range from two to ten—before construction gets under way on an operational Nike-Zeus site. But meantime some construction is under way on facilities to test components of the Zeus system. the new budget earmarks $67.5 million for such spending.



Coliseum Gets Suspended Roof

Architect Paul Thiry's Coliseum of Nations—a $8.8-million complex—will be constructed by the State of Washington on the Century 21 Exposition site in Seattle early next year.

The spectacular cable-suspended roof of multi-colored aluminum panels will be 110 ft high at the apex. It will be supported by steel trusses rising from sculptured, tripedal, concrete abutments at the middle of each of the four sides.

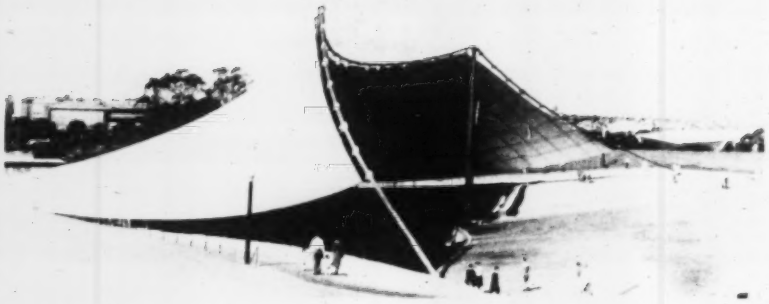
The principal building will cover 460,000 sq ft under one roof, with 129,000 sq ft of this enclosed within glass walls as unobstructed space. Clear span will be 360 ft.

Each steel truss will be approximately 10 ft deep, 8 ft wide at the top and 4 ft wide at the bottom.

The trusses and a prestressed concrete edge beam will hold 29,700 ft of prestressed steel cable taut in a hyperbolic-paraboloid form. The cable will be laced from the trusses on 8-ft centers. The peripheral edge beam will be hollow and warped to conform to the roof slopes. This diaphragmed beam, spanning 100 ft, will contain air circulating units, electrical and mechanical piping.

Roofing over the cable structure will consist of 8x8-ft insulated aluminum panels.

The 400x400-ft main building will house international science and commercial exhibits. Plans call for the City of Seattle to purchase the building after the exhibit and convert it into a sports stadium with a seating capacity of 18,000. Conversion cost is expected to run $1 million to $2 million.



Aluminum Music Bowl Wins Contest

A tent-like structure won the $25,000 R. S. Reynolds Memorial Award for 1959. It is the Sidney Myer Music Bowl at Victoria, Australia.

The design won because of its unique aluminum suspended roof. Fan-shaped, it is supported at the front 70 ft above ground on two steel masts and at the rear of the stage by a concrete anchor at grade. The enclosure, carried on steel wire rope, is plywood faced with aluminum.

It cost $560,000.

The prize-winning design was drawn up under the supervision of Barry B. Patten of Yuncken, Freeman Brothers, Griffiths and Simpson, architects, Melbourne, Australia.

The Reynolds award was established as a tribute to the late founder of Reynolds Metals Co.

The Music Bowl is 200 ft long and nearly 200 ft across at its widest point. About 40,000 cu yd of earth was excavated to a maximum depth of 55 ft to form the triangular, sloping floor of the amphitheater. The excavation was faced with 2 in. of sprayed-on concrete. About 2,000 persons can be seated under the roof and 22,000 on the lawn outside.

The 40,000-sq-ft roof covering is made of 5-ply, marine-grade plywood sandwiched between 26-ga aluminum. The panels are 7 x 25 ft by ¾ in. thick.

The roof is supported on 1¾-in.-dia wire ropes, except for a cable composed of seven 3½-in.-dia wire ropes, which spans the masts at the front of the structure. The 1¾-in. ropes are spaced 6 ft c-c in both directions.

The Music Bowl was built by Holland-Ascom Pty. Ltd., general contractors, of Melbourne.

Guy Wire Loosened—Frame Falls

The design of a 105x120-ft gymnasium for a high school in Ridgefield, Conn., called for eight 120-ft, two-hinged arches. But when the erector, Joseph Gawel, of Kent, Conn., had five of them up with purlins between them, someone loosened a guy to allow the sixth to be moved into position.

Maybe this brace actually kept the frame in fine balance, maybe a gust of wind proved too much for the remaining guys. Down came all the arches.

Sherwood, Mills & Smith, Stamford, Conn., were the architects. Kreisler-Borg Construction Co., White Plains, N. Y., is the general contractor, and Riley Laminated Products, Inc. supplied the laminated timber arches.

Soviet 'Shakedown'

Russian reports use of vibrations to drive piles

Vibrations can drive piles about five times faster than a hammer, says M. M. Levkin, member of a six-man delegation of Russian soil and foundation engineers now visiting the U.S.

Sheetpiles, reinforced concrete piles, H-piles and cylindrical concrete caissons are installed in the Soviet Union by attaching heavy vibrators to them.

Mr. Levkin described the operation last week at a soil and foundation seminar at Princeton University sponsored by the Highway Research Board of the National Academy of Sciences and the American Society of Civil Engineers, in cooperation with the Academy of Construction and Architecture, U.S.S.R.

Here's how the Russians do it:

Vibrators are bolted to piles. Rectangular holes for bolts are cut in sheetpiles with acetylene torches; bolts are set into reinforced concrete piles.

The pile, with vibrator attached, is lowered into place with a crane. Vibrations reduce the skin friction on the pile and drive the pile into the soil. The method can also be used for batter piles.

Vibrators are also used in Russia to simplify the withdrawal of piles. And small vibrator units are built into the bottom of shovels to increase their penetration of high-density soils.

The Russians' initial vibrator weighs about 4½ tons and is enclosed in a 4-ft sq steel box. Eccentric weights are attached to four shafts within the box. An electric motor drives the shafts at 420 rpm. The unit tapers to a narrow base to which piles are attached.

Later vibrator models weigh as much as 10½ tons and have eight shafts that are operated on two frequencies. Larger units are in the development stage.

Although the vibration method of pile-driving is almost unknown in the U.S., it has been tested here.

W. P. Kinneman, of Raymond International, Inc., New York City, told the Princeton seminar his company had found the method unsatisfactory.

He said that Raymond had used a vibrator on two 80-ft piles in sandy clay soil in California. One was a step-tapered pile and the other was an H-pile. The vibrator drove each pile to a depth of 55 ft and could drive no farther, he said. A steam hammer then drove the piles in at the rate of two blows per inch in the beginning and five blows per inch at final penetration.

The visiting engineers will take part in similar seminars at Massachusetts Institute of Technology, Harvard University, the University of Illinois and the National Academy of Sciences.

New James River Bridge Gets Better Protection Against Corrosion and Weather-Wear with...

One of the most important achievements in the construction of Virginia's new Richmond-Petersburg Turnpike is the James River Bridge. This 100-span highway viaduct, carrying two 40-foot parallel roadways, was designed by Parsons, Brinckerhoff, Hall and Macdonald, and Dr. D. B. Steinman.

• **Steelwork,** fabricated by the American Bridge Division, United States Steel Corporation, was shop-coated with Pittsburgh's X-L-O Structural Steel Primer. This was done to protect these steel shapes against corrosion during shipment and erection. Need of costly metal cleaning was eliminated. Uniform coverage was assured even over surface irregularities. Use of X-L-O permitted prompt shipment of these steel shapes regardless of weather, speeding up construction.

• **X-L-O also served** as an excellent foundation for final coats. This superior primer is available in combination of red lead and iron oxide, or 100% red lead. Pittsburgh's IRONHIDE® and METALHIDE®, in suitable colors, can be used for field painting.

• **Pittsburgh's long experience** in supplying protective finishes for structural steel shapes of all kinds can save you time and money. Why not ask us for advice or suggestions. Write, wire or phone Pittsburgh Plate Glass Company, Industrial Finishes, 1 Gateway Center, Pittsburgh, Pa.

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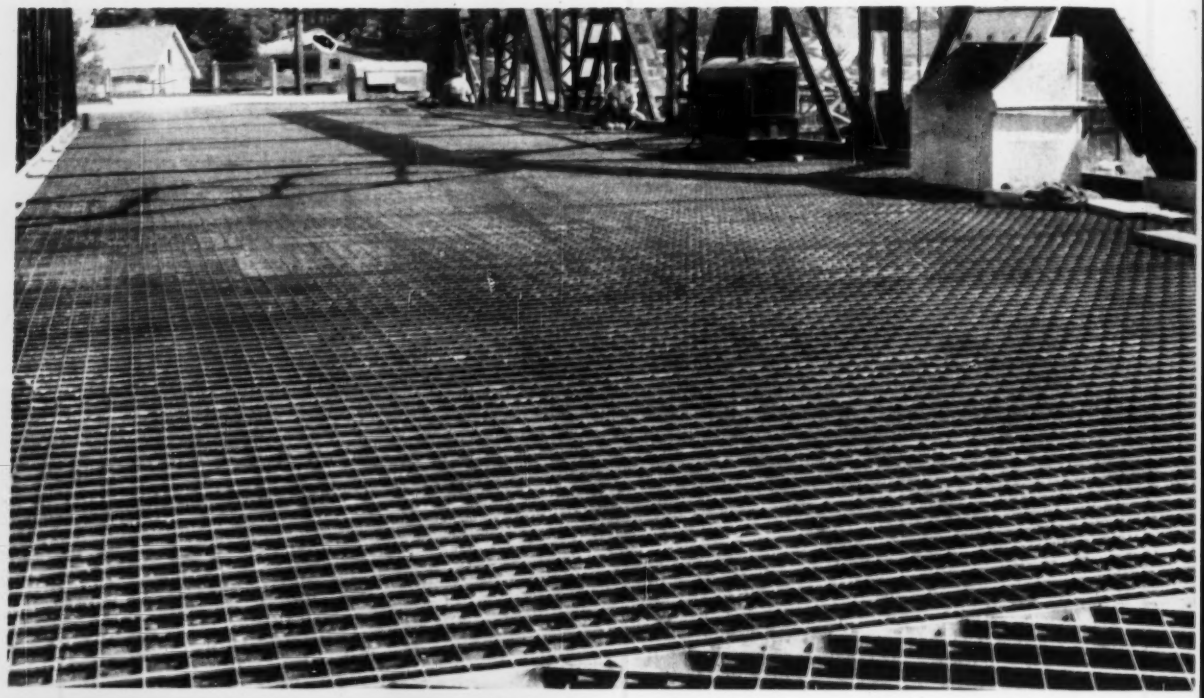

Carbondale, Pa. Bridge. High Welding Company, contractor. William P. Ross, job superintendent. This bridge has three approaches of various lengths and grades, and one 125' main span. 4,900 sq. ft. of 4¼" I-Beam-Lok (with ¾" overfill) was laid on the main span, with 18,725 sq. ft. of 5" open-type I-Beam-Lok placed on the three approach spans. Also, 1,000 sq. ft. of Tee-Type Sidewalk Flooring.

The old flooring on the 24' roadway was made up of a layer of asphalt on 4" brick, over a series of concrete arches between stringers varying in depth from 6" at top of arch to 21" at the stringer. While no accurate weight estimate was made of the complicated floor system, Mr. Ross figured that at most, the new open I-Beam-Lok steel floor weighed but 15% of the obsolete floor it replaced. *In other words, I-Beam-Lok reduced deadweight of approaches approximately 85%.*

In discussing this project, superintendent Ross said that in addition to the usual I-Beam-Lok advantages to contractors (speed of installation, ease of handling, and made-to-order working platform), the use of this lightweight steel flooring eliminated the necessity of working from below the bridge where both railroad tracks and power lines would have been encountered. Conventional construction would have required *two time-and-labor consuming operations—the placing of forms and then stripping them after pouring*—while I-Beam-Lok allowed all work to be performed top-side.

Superintendents on reflooring

When you want information about a product, go out and talk to the men on an actual job. They deal with facts, not theory. They'll tell you exactly how it handles; whether it does what it is supposed to do; whether it solves problems, or causes them. That's why we visited the two reflooring jobs shown here. Both project superintendents are experts on reflooring old bridges. Incidentally, the men are brothers, and have been employed by the same contractor, High Welding Company, of Lancaster, Pa. for more than 20 years.

USS and I-Beam-Lok are registered trademarks

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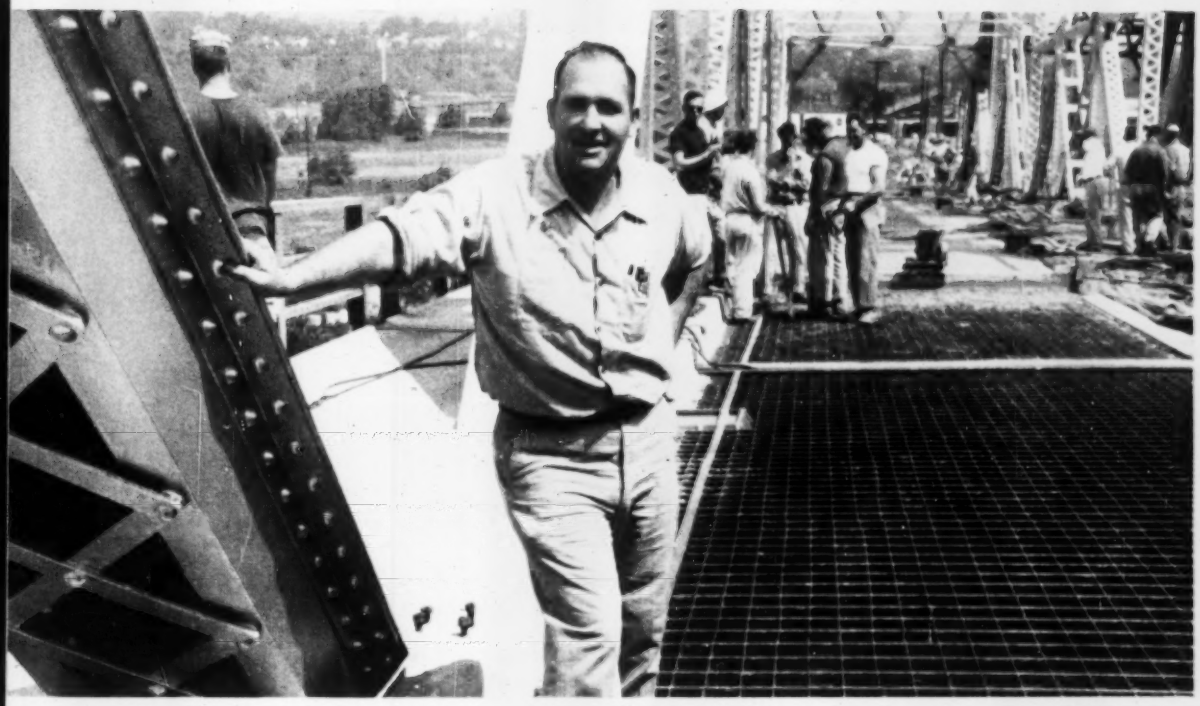
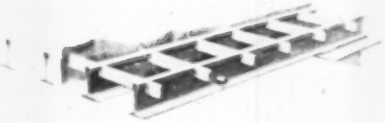


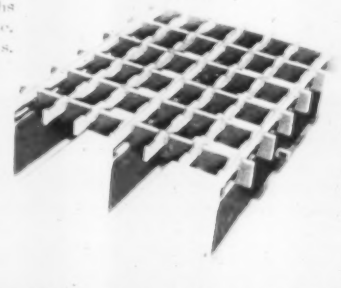
different jobs point out extra advantages old bridges with USS AmBridge I-Beam-Lok

Mulberry Street Bridge, Scranton, Pa. High Welding Company, contractor. Lester D. Ross, superintendent. This project involved reflooring an old bridge which carried two 23'6" roadways, 610' long, plus two 6' sidewalks. One of the roadways carried abandoned street car tracks; the other was paved with layers of asphalt, binder, and concrete piled to a thickness of 6 inches atop ½" steel buckle plates. All of which, together with the old tracks, had to be removed and replaced with 4¼" concrete-filled type I-Beam-Lok. Some new beams and stringers were erected on both roadways. A total of 31,000 sq. ft. of 4¼" concrete-filled type I-Beam-Lok was used for the roadway, plus 10,500 sq. ft. of 2" USS Tee-Type Sidewalk Flooring. (The roadway received a ¾" overfill.)

Commenting on this job, Lester Ross states that, in addition to the regular weight savings, speed of erection and ease of handling, another advantage was that the I-Beam-Lok was specially shaped with a 4" camber to fit existing beams, thus eliminating additional deadweight and framing problems.

Concrete-filled I-Beam-Lok. In 3" and 4¼" depths. Weighs 47 lbs. psf. and 61 lbs. psf. respectively including concrete. If ¾" over-fill is used, add 9 lbs. psf. to above weights.





Open-type USS I-Beam-Lok. 5" depth. Weighs 18.8 psf. Available in units 6'2" wide and up to 48' long. Can be applied directly to stringers.

For detailed information about this lightweight steel flooring, contact the nearest office, or write direct to Pittsburgh. Ask for a copy of our 32-page catalog.

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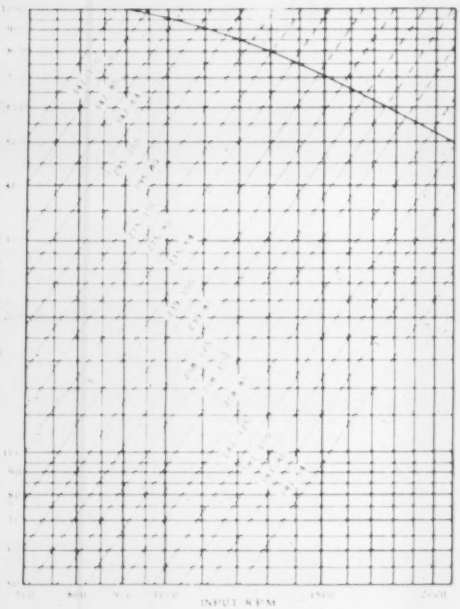

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AEC Selects Alaska Site For Atomic Excavation

The Atomic Energy Commission hopes to go ahead late next year or in 1961 with an experimental harbor-excavation atomic blast in Alaska, despite a lack of commercial interest.

Champions of Project Plowshare—AEC's program to develop peaceful uses for thermonuclear explosives—initially thought in terms of blowing out a big harbor on the bleak coast of northern Alaska, thus opening the area up to economic exploitation (ENR Nov. 6, 1958, p. 17). However, as AEC Chairman John McCone put it, "We have not got a customer."

Nevertheless, AEC—which began field studies in the area between Cape Seppings and Cape Thompson last summer—has now decided to go ahead with a smaller test near Cape Thompson.

This summer the U. S. Geological Survey will sink two 880-ft shafts to determine the nature of the rock. Other scientists will try to assess possible biological effects of the proposed blasts.

AEC officials stress that such specifics as number, size and spacing of the nuclear devices must await study results. But at this stage they are thinking in terms of setting off three small devices (the tens-of-kilotons range) at 100-yd intervals from the beach to blast out an entrance channel some 500 to 600 yd long. Then two larger devices (perhaps in the 100-kiloton-or-above range) will be exploded some 600 ft apart to gouge out a turning basin 1,500 to 3,000 ft in diameter.

The devices probably would be set off at a depth of 500 ft or more, thus containing 95% or so of the fission products beneath the ground.

'Touchdown' Area Lights Going Into New Runway

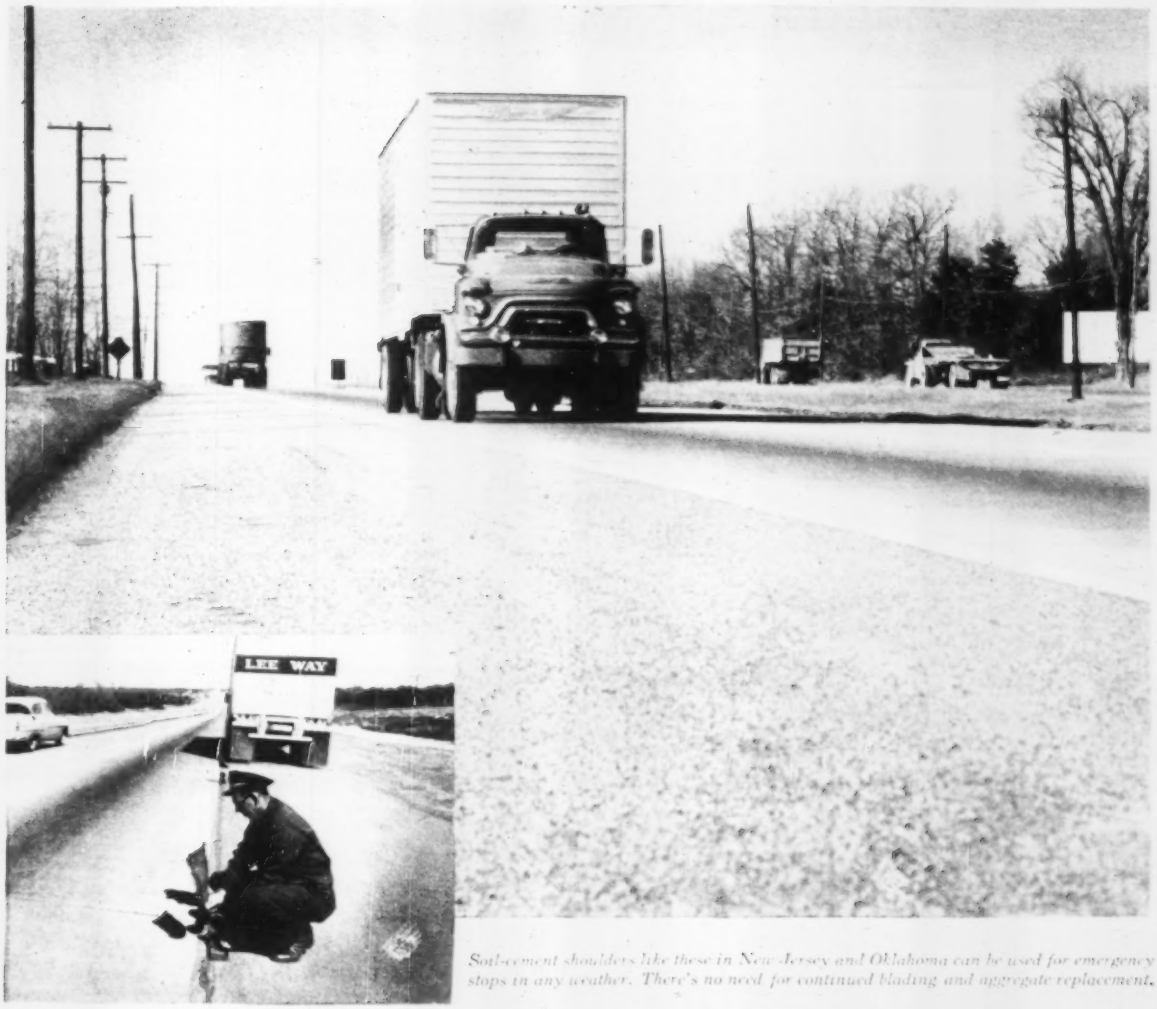
Lights to eliminate the "black hole" of the "touchdown" area are going into a new runway at New York International Airport.

It is a narrow-gage lighting system that allows the pilot more accurately to line up and judge initial contact with the runway after he has passed over the flashing approach light system.

A row of lights is being imbedded 50 ft to each side of the centerline. The fixtures are flush with the pavement surface and extend 3,000 ft from each end of the runway.

Half the fixture houses powerful lamps and is covered with a steel plate. The other half is formed of long, narrow channels that direct the light up and out toward the oncoming plane (ENR Apr. 9, p. 65).

The fixtures are designed to take the weight of the heaviest planes.



Soil-cement shoulders like these in New Jersey and Oklahoma can be used for emergency stops in any weather. There's no need for continued blading and aggregate replacement.

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It's no wonder soil-cement is America's fastest-growing, low-cost paving material for roads, streets, shoulders, subbase, airports and parking lots. In the last 5 years, the use of soil-cement has increased 250%. Write for free booklet, "*Soil-Cement Shoulders for Modern Highways*." (U.S. and Canada only.)

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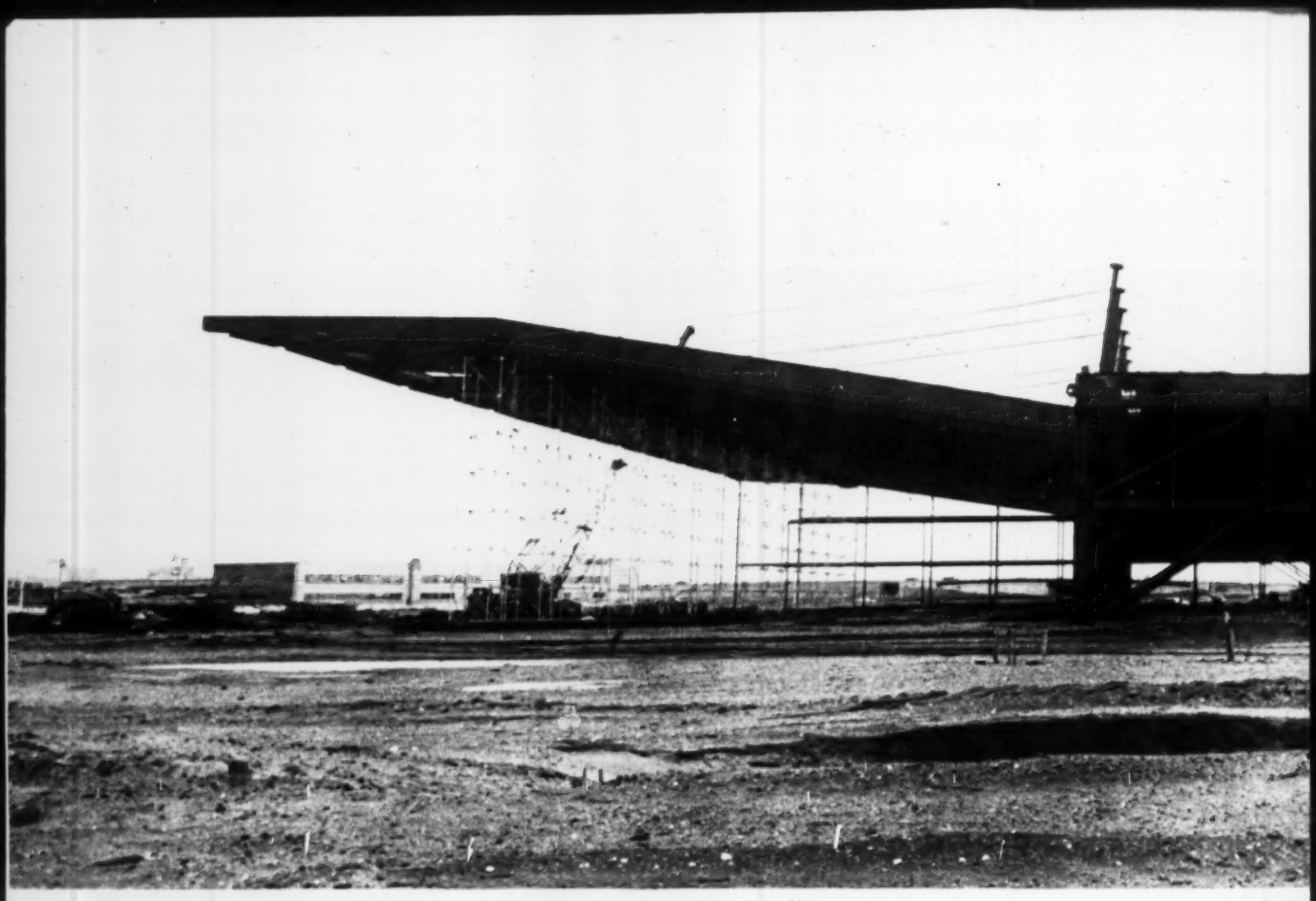


Tomorrow's Jet Age Hangar Is

The double-cantilever, cable-suspended roof above stretches 400 ft from tip to tip. Box girders for the roof framing cantilever 158 ft.

Under the roof this week, workmen at New York City's International Airport (Idlewild) are putting the final touches on a 400 x 600 ft hangar frame.

When the project is completed next summer, it will house the mammoth Boeing 707 and will be used by five foreign airlines (BOAC, KLM, Air France, Lufthansa and Sabena).

The job will cost $10 million, including support facilities and taxiways. It's a bargain for what they're building.

Port of New York Authority, owners and builders, designed the structure with these objectives:

- Enough space for jet-age aircraft.
- Structural economy.
- Maintenance and operating economy.
- An appearance that would blend with the rest of International's development.

The size of the Boeing 707 requires an aircraft "box" at least 45 ft high, 140 ft wide and 150 ft from front to rear. To avoid built-in obsolescence, PNYA engineers used an aircraft box 45 ft high and 170 ft wide, measuring 184 ft from front to rear, including a nose pocket extending into the core area of the hangar. Initially, the hangar will take six planes, three to a side; additional bays can be built as needed in the future.

The roof is the largest structural element. For maximum flexibility of operation, cantilever hangars, with no fixed columns at the front, are the most utilitarian. The problem was to provide a cantilever roof with maximum economy.

For the necessary span of 158 ft, the usual procedure of using a cantilever truss would mean a unit 23 ft deep at midpoint. These deep trusses create dead space, which must be covered, heated, drained and lighted. The solution for Hangar 17 was a suspended cable cantilever girder, with the girder acting as the roof line. The result: no dead space and an appreciably cheaper structure.

Roof framing for Hangar 17 cost about $4.50 per sq ft. A comparable through-truss cantilever roof would run to nearly $7.50 per sq ft.

Reduced maintenance and operating costs follow as a matter of course with the cable-hung design; painting is cut to a minimum and heat needs drop.

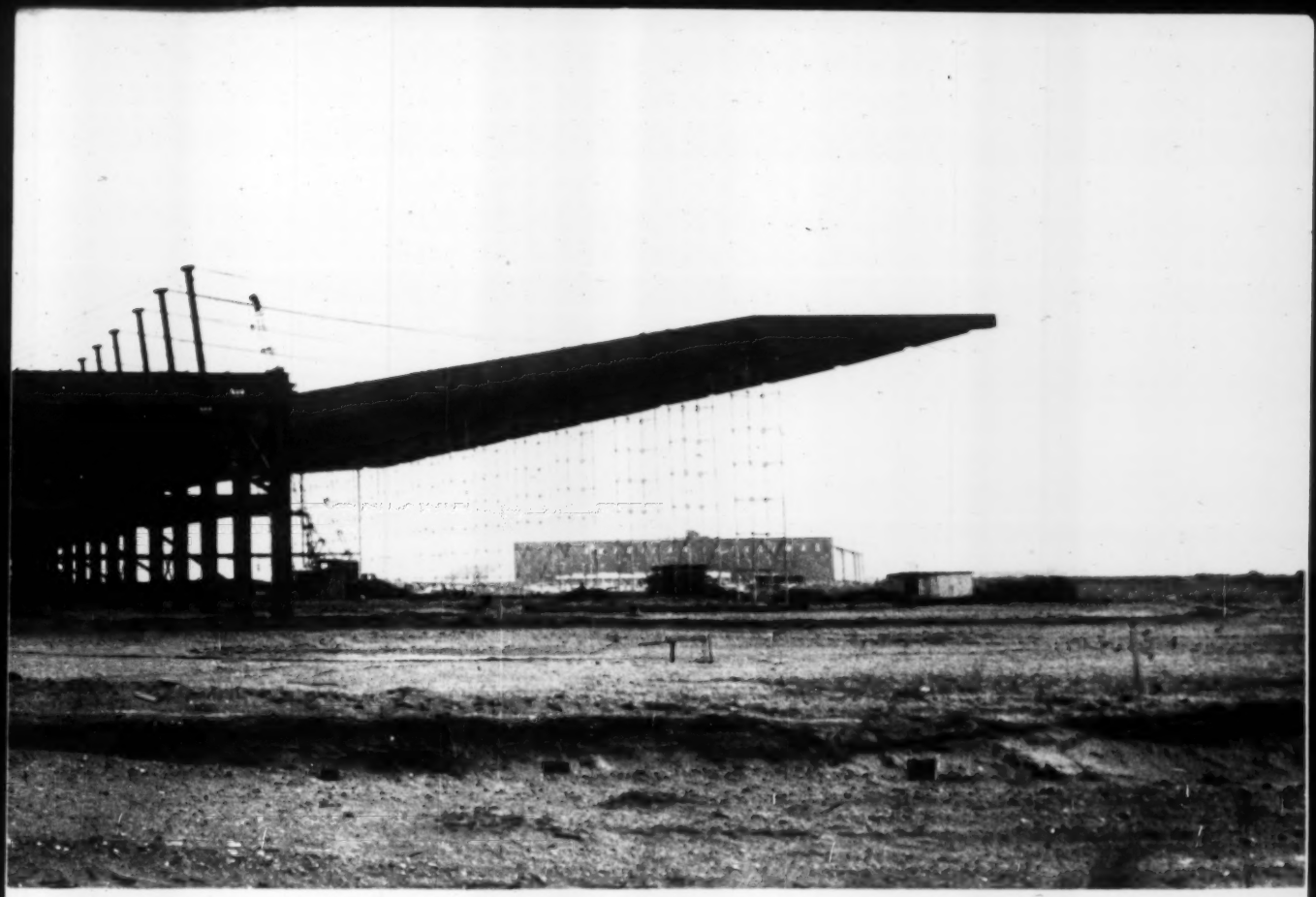
While the designers set out to produce a good-looking addition to the airport, looks took a back seat to function.

Sixteen cantilever girders are pin-connected on either side of the central core, 31 ft above floor level. This core area is a two-story, box-frame building. Cross-girders at the roof are the same shape as the girders cantilevering out from them over the hangar floor—5 ft deep and 3 ft wide.

The core box frame serves four purposes in the hangar design. It:

- Carries the core roof.
- Supports the hung second level in the core.
- Takes the direct stress of the roof cantilevers.
- Acts as back-stay anchorage for the suspender cables.

These cables run from one side of the core over masts on the opposite side and out to anchor points on the girders, 108 ft from the core. Design stress in the 2¼-in. galvanized cables is 80,000 psi; ultimate stress of the galvanized strands is 200,000 psi. Anchor sockets are high-



Here Now

tensile steel to reduce their size as much as possible. At the inboard end, on the core roof girder, cables are button-ended; at the outboard end, there's a threaded insert and eye for tensioning after erection.

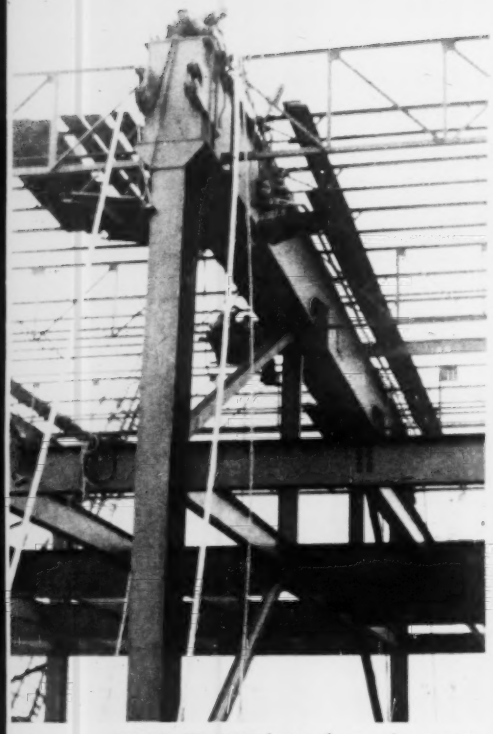
The actual steel erection process went like this:

Starting on the core area, steel crews erected reinforced 36WF columns over individual pile caps. (Each pile cluster included twenty-five 25-ton-capacity timber piles. A design alternate allowed concrete piles, but the low bidder elected the timber design.) Pile lengths vary from 35 to 50 ft. Pile caps are all 4,000 psi concrete. Again the purpose was to reduce size of components as much as possible. The 36 columns on these caps carry an intricately designed but simply executed "backbone" frame for the hangar roofs. With the top cross-over girders at roof level, steel crews also erected the second floor core framing. This second level does two things:

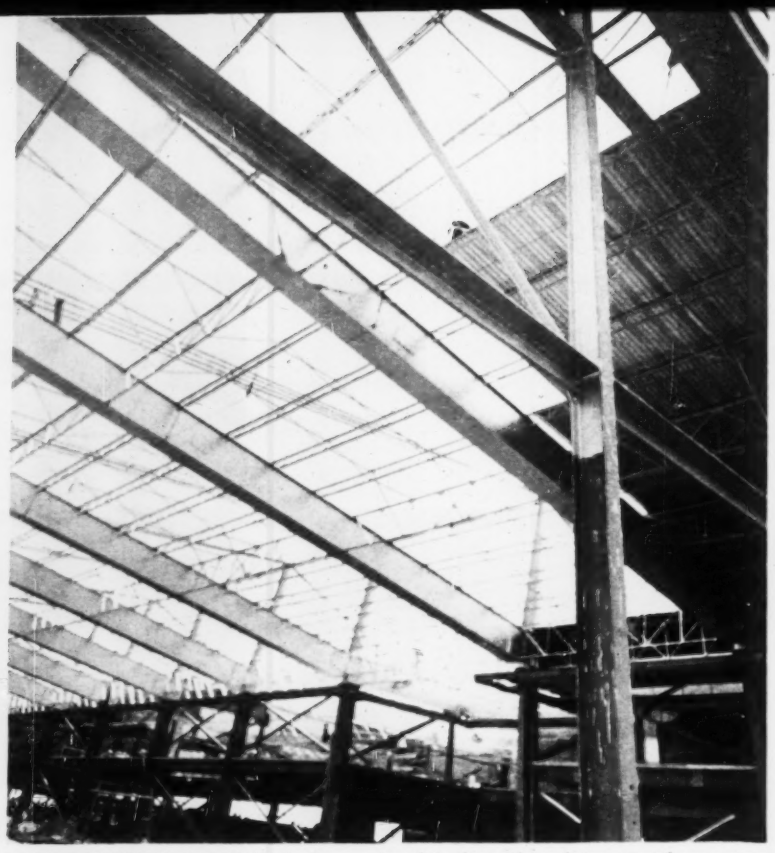
- It acts as a strut between column lines and with hangars, from the cross-over girders above.

(*Turn the page*)

Suspender cables cross over the hangar core to cut flutter.



CORE FRAME bents have pin connections for cantilever girders and cable anchors.



ROOF DESIGN eliminated the dead space found in deep, through-truss cantilever system and cut framing costs by 4%.

• It provides dead load anchorage for the inboard ends of the suspender cables. Diagonal bracing in all three directions of the core counteract wind stress and racking.

After the core, workers turned to the box girders of the cantilever roofs. These are 158 ft long, so a field splice was added to the design 72 ft from the outer ends. The two sections of each girder were welded together on the ground then lifted into place in one piece. Gangs connected inner girder ends to the main pins at the core. Erection and jacking towers, 109 ft out from here, supported the girders just under the outboard cable anchor points.

Next came masts and cables. After the 27-ft high masts were up, workers clamped saddles to the four premarked cables of each girder.

First, the saddle went up with cables attached. Then cable ends were slipped into the side-opening anchor plates at the outboard girder ends and at the cross-over girders, 11 ft in from the opposite side of the core. Plates over the U-shaped cable slots closed the anchors. Jacks on the erection towers held the girders above their final position for easy cable rigging and stressing.

An essential design requirement calls for all four cables at each girder to carry the same stress. PNYA engineers are more concerned about this point than about having exactly equal stresses between sets of cables among the various girders.

Each outboard cable fitting was threaded for a rigging eye. A pulling line from this eye extended out to a 75-ton crawler serving as a deadman to the side of the hangar. (The pulling line was rigged as a direct line extension of the suspender cable.) A dynamometer was placed in the line just before the travelling deadman. A second crane between hangar and deadman pulled at a right angle on the center of the line to load the suspender cable.

Steel workers added shims between cable buttons and anchor plates as the pulling line was "plucked" to the proper loading for each of the four cables at a girder.

With roof girders and purlins between them completed, workers set up stiffening trusses at the hangar ends for bracing and to carry the end curtain walls. On each side of the hangar, six doors, 85 ft wide, will roll on three tracks with weight going to the base tracks while runners at the roof spandrel provide stability.

Hangar cost has proven the economy of PNYA's design. The hangar covers 240,000 sq ft at only $20 per sq ft, including basic building equipment. PNYA engineers believe a double cantilever truss design would have cost at least $500,000 more.

White Plains Iron Works, White Plains, N. Y., is the contractor for steel fabrication and erection. Claymont Iron Works, a subsidiary of Colorado Fuel & Iron Co., fabricated the welded box girders. J. V. Roebling, another Colorado subsidiary, provided the cable strands. M. Parisi was the foundation contractor; Planet Construction Co. is doing superstructure.

Roof Design: Key Facts

Design Criteria:
Roof live load . . . 40 psf
Horizontal wind load . . . 20 psf
Wind uplift on roof system . . . 30 psf

Roof System:
Box Girders: Welded Plate
Webs: ⅜ to ½ in. thick
Flanges: 1 to 2 in. thick
Horizontal diagonal rod bracing on lower box sections
Lateral bracing @ 35 ft c-c
Roof purlins: Open web joists
20-ga. steel roof deck
1-in. rigid insulation
Built up roof; 20-year bond

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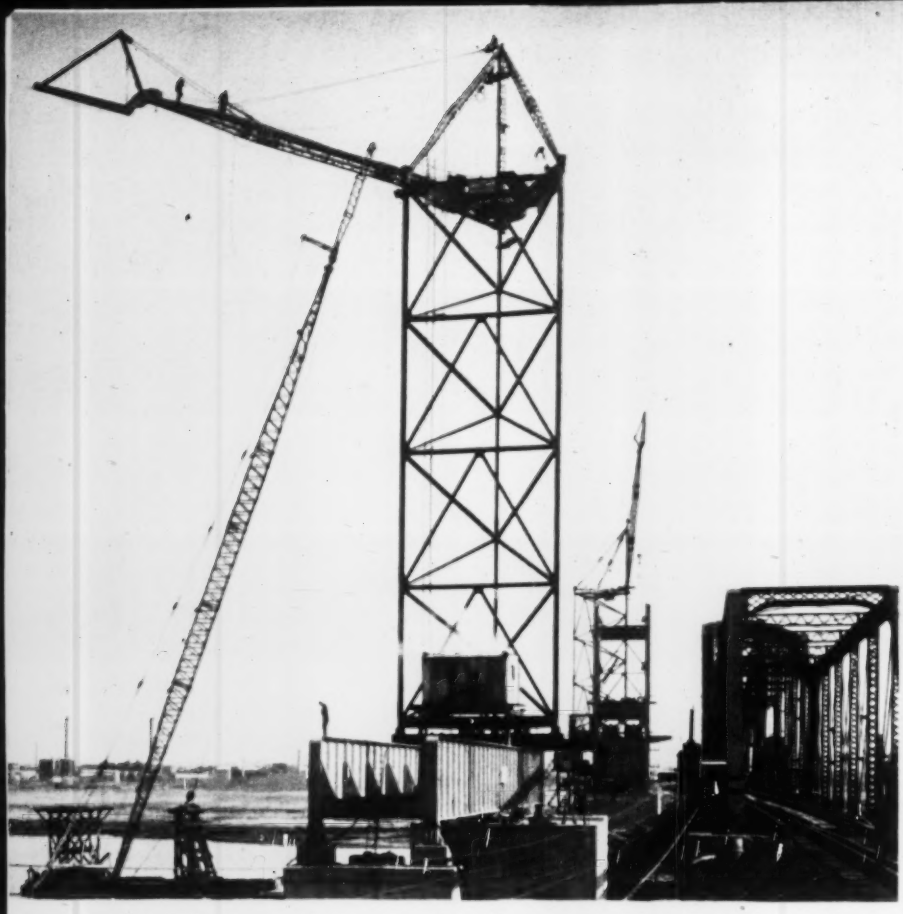
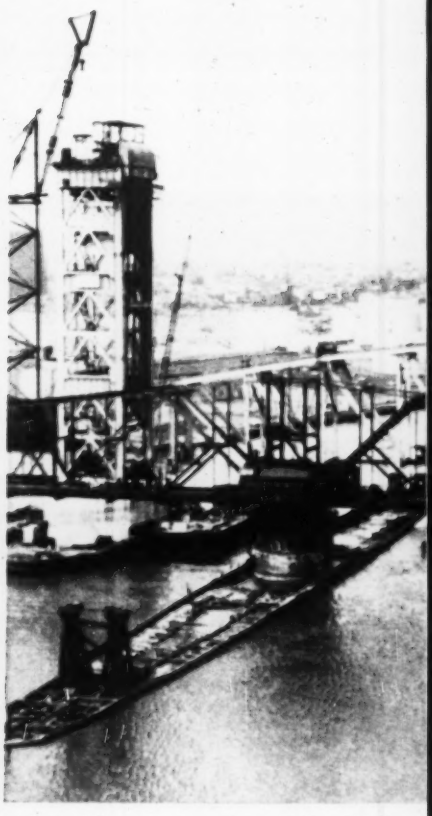


Limited clearance was a prime design consideration for . . .



this bridge across the Arthur Kill.

How the World's Longest

The world's longest vertical-lift span was floated into position and raised to the top of its towers last week. The span is a 558-ft, 2,000-ton unit that crosses the Arthur Kill at Elizabeth, N. J.

Its components now include 18,000 cu yd of concrete and 55 tons of structural steel in the substructure, about 4,500 tons of structural steel and 500 tons of operating machinery, sheaves, roller bearings and cables in the superstructure. And now being installed are more than half a million dollars worth of electrical equipment and controls.

Features of the job include a "tower drive" that controls the 104 ft of travel, a dual electrical control system, the latest in safety devices and unusual provisions for plumbing towers during construction.

Complicating the whole operation is the necessity of erecting the new bridge only 60 ft from an old span while not interfering with traffic.

The structure is part of a 1,047-ft-long single-track crossing of the Arthur Kill between Arlington, Staten Island, N. Y., and Elizabeth, N. J. (ENR Sept. 5, 1957, p. 36). It is being built for the Staten Island Rapid Transit Railway Co. to replace a steam-operated swing span built in 1887. This 72-year-old bridge is in fair condition and still operable, but it has long been considered a navigational hazard. Its twin 207-ft spans make it one of the five longest swing bridges in existence, but its center pier obstructs a shipping lane used by some 2,400 vessel passages a month.

The old bridge is the only rail crossing to Staten Island and therefore must be kept in operation until the new bridge is ready for use. This posed many problems both in design and construction.

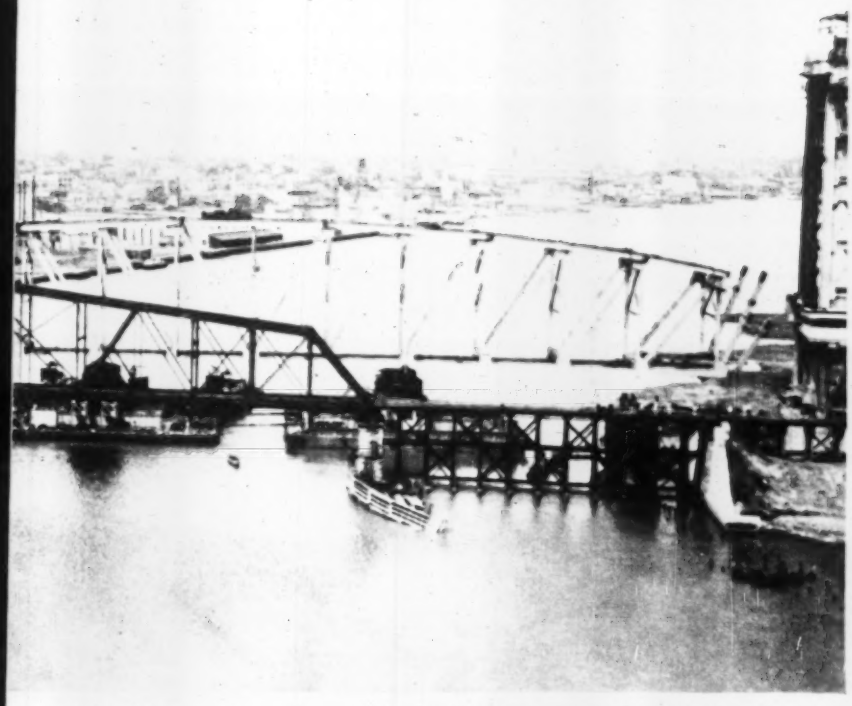
The new bridge is being erected parallel to the old one and 60 ft north of it (see picture). It consists of the lift span, two towers and 15 plate-girder approach spans.

Because of the slight skew of the new channel and the space requirements for the pier and fender construction, a main span in excess of 550 ft is needed to clear the channel. The feasible type of span for this location is a vertical lift. It provides the required clearances and makes it possible to construct the second bridge with a minimum of interruption to the operation of the old bridge. (The lift span will normally be kept in the raised position because there's more water traffic than rail traffic.)

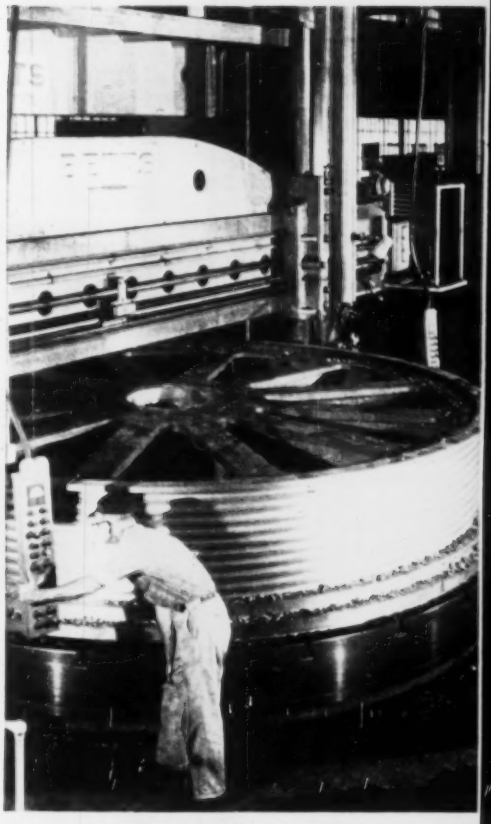
The new span weighs just under 4 million lb, but more than 99% of this is balanced by counterweights. It is designed for a single-track Cooper E-50 live load, in accordance with specifications of the American Railway Engineering Association.

The bridge has a "tower drive" with a set of operating machinery located at the top of each tower. This machinery raises the two ends of the span simultaneously, and the controls are electrically interlocked to keep the

Co-authors Alfred Hedefine and Thomas R. Kuesel are both with Parsons, Brinckerhoff, Hall & MacDonald, consulting engineers for the Arthur Kill bridge project. Mr. Hedefine is a partner in the firm and Mr. Kuesel is the project engineer.



The lift span was floated into place last week and hoisted on . . .



monster sheaves, like this one.

Vertical Lift Bridge Will Work

span level throughout its 104-ft travel. The time for raising or lowering the span is about two minutes, and the entire operation is controlled by a single operator in a control house on the east tower.

• **Substructure problems**—The two main piers are founded on hard red shale rock in pockets blasted out of the river bottom. The west pier presented some extremely difficult problems both in design and construction (ENR Nov. 28, 1957, p. 23).

Difficulties with "intrusion" grout placed in the seal of the west pier resulted in a redesign of the pier foundation using drilled-in-caissons (ENR Aug. 29, 1958, p. 40).

The west pier is in deep tidewater on a bare rock bottom and required an elaborate fender system. A series of rock-filled, steel sheetpile cells at each end serve as a primary fender. Central section of the fender, also of steel sheetpiling, is designed to provide a springy cantilever capable of deflecting glancing blows.

• **Lift span**—The lift span truss has a depth of 70 ft (1/14th of the span) at the center and about 43 ft at the ends. Its width of 27 ft c-c of trusses (about 1/20th of the span) is wider than needed for clearance requirements of a single track railroad, but it was employed to limit stresses and lateral deflection under wind action. Even with the extra width, it was necessary to add approximately 7% to the sections of the lower chord members to resist wind stresses.

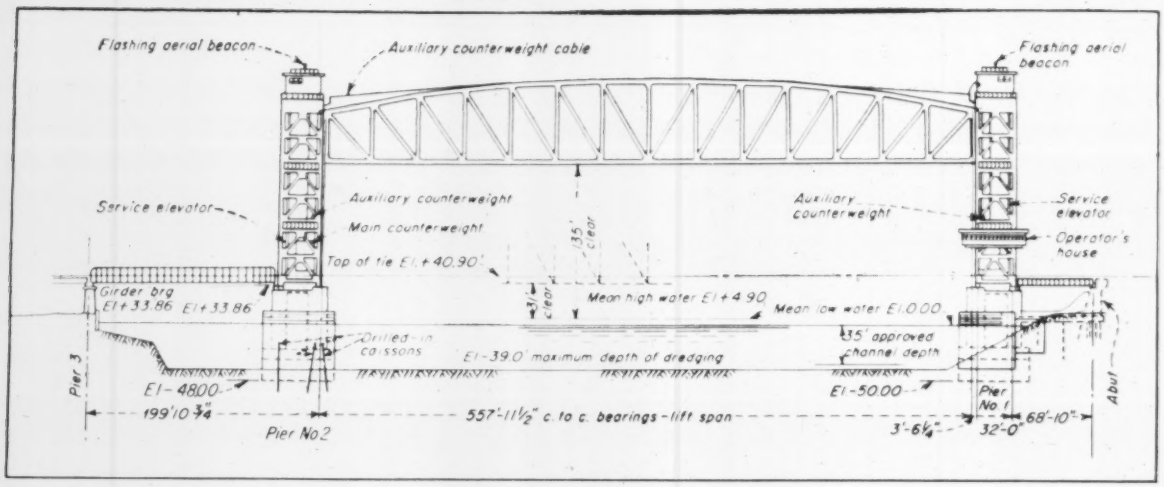
A Pratt system of trussing was chosen to provide stiffer connection between the floor beams and the truss than is provided by the Warren system, in which the diagonal members alternate in direction. This stiffness reduces the twisting of truss members that results from floorbeam deflection under the passage of a train—a condition that has caused fatigue distress in the vertical members of some railway bridges.

The floor consists of timber ties supported on heavy rolled beam stringers. The stringers are connected to the floor beams in a manner designed to reduce bending stresses in the connection angles resulting from live load deflection, and to facilitate removal of the stringers for replacement.

The stringers carry the highest live load stresses of any members in the structure and will have to be replaced during the lifetime of the bridge. At two points in the span (four panels from each end), longitudinal stringer expansion joints relieve strains in the floor system resulting from the live load extension of the lower chords of the trusses.

The dead load of the lift span is supported at each end by 40 wire ropes, each 2¼ in. diameter, which are attached to counterweights in the towers. The ropes are attached to the lift span by means of a lifting girder, which spans between the trusses in the plane of the end vertical members above the railroad clearance line. The attachment of the ropes to the lifting girder includes a device for adjusting the lengths of the ropes so that they share the load equally.

A linkage arrangement at the top of the tower permits supporting the counterweight from the tower so the counterweight ropes may be removed



GENERAL DESIGN FEATURES—The 2,000-ton lift span was prefabricated, then floated into place.

and replaced. To effect this, the counterweight support linkage is attached, and two special portable jacking struts are installed between the lifting girder and the end floor beam of the lift span.

Hydraulic jacks are then placed underneath the floor beams, reacting on the pier top. Extending the jacks causes them to support the lift span through the jacking struts. Since the counterweight is supported from the tower top, continued jacking causes the ropes to become slack, at which time they may be removed. Both rail and water traffic must be disrupted to perform this operation.

The reactions from live load on the span when it is down and open to railroad traffic are carried directly to the piers by cast steel shoes located under the four corners of the lift span. The lower portions of these shoes are attached to the piers, but the upper portions ride with the span and automatically engage the lower portions when the span is seated.

• **Counterweights**—The counterweights are composed of concrete-filled steel boxes. Pockets are constructed in the concrete in which removable balance blocks are placed. The number of blocks may be varied to adjust the balance of the span during construction and to account for any future changes in the weight of the span.

In large vertical lift bridges with high lifts, the weight of the main counterweight ropes is sufficient to require an auxiliary balancing system. This occurs because the weight of the greater part of the main ropes is on one side of the sheaves when the span is down, and on the other side when the span is up.

On this bridge the unbalanced weight of the main counterweight ropes amounts to 2½ times the design operating force, so a substantial saving in the initial cost of the operating equipment and in operating cost is effected by the auxiliary counterweighting system. The actual balance is such that the span is slightly heavy when it is down, to assist in seating.

• **Towers**—Each tower has four columns, braced on all sides, with an open space inside for the counterweight. The columns are spaced 55 ft c-c transversely, and 52 ft longitudinally.

At the top of the tower, the counterweight ropes pass over four 15-ft diameter cast steel sheaves (10 ropes to each sheave). Each sheave weighs 25 tons, and is supported on two roller bearings, which rest on longitudinal sheave girders that pass between the sheaves.

The use of roller bearings instead of bronzed bushed bearings reduced the maximum operating force by 60%. This resulted in savings in equipment size and reduced power costs. This was more than enough to offset the additional cost of roller bearings.

The eight longitudinal girders are supported by two transverse girders that frame into the tower columns. The front transverse sheave girder, which carries about 85% of the sheave load, is 15 ft deep.

To make sure that the front tower columns, on which the lift span is guided during its travel, are truly vertical, two special features are included in the tower to permit plumbing it during construction. A slotted hole in the rear column anchorage permits shims to be entered above or below the square pin connecting the column to the anchorage. This facilitates raising or lowering the rear tower columns, rocking the tower as a whole about the front column bases.

To provide for this rocking, the front column base plates are machined to a slight curvature. This curvature also concentrates the front column load in the center of the grillage and minimizes against edge loading of the column on grillage.

• **Lift span drive**—The lift span is operated by electrically driven gear trains that engage circular rack gears on the rims of the main sheaves. To keep the two ends synchronized and to maintain the span level at all times, an adjustable voltage direct current drive is used. The drive in each tower consists of a main motor-generator set, a direct current drive motor and a control motor-generator set. The system is so arranged that the speed of the drive motor is governed by the output voltage of the control generator. The voltage may be varied by manual control during acceleration and deceleration of the span, but it is automatically controlled by the electrical skew control system.

The skew control system operates on a differential in voltage between the two control generators to reduce the speed of the leading motor and increase the speed of the trailing motor, until the two are synchronized. Control is so sensitive that the two ends of the 558-ft span will normally be kept within one inch of being perfectly level.

In case of electrical failure of the skew control system, two independent skew-sensing devices are included. These will cut off power to the drive motors if the span should get out of level to the extent that there might be danger of the span binding against the towers.

(Story continued p. 45)

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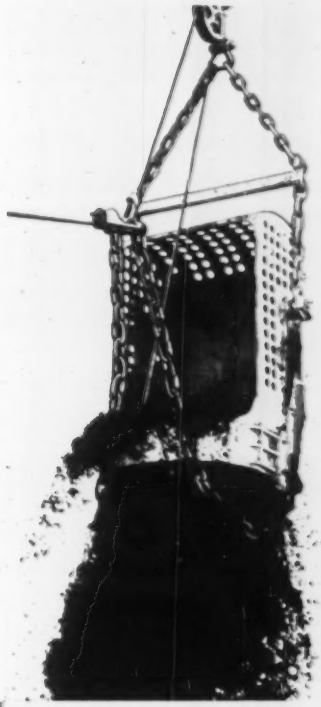
BIGGER PROFITS



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The new lift span on the Celilo Bridge over the Columbia River is being raised to permit river passage. Westinghouse supplied all the major elements of the electrical system, which can raise the span to 75 feet above mean high water in 90 seconds.

Sid Brown, Westinghouse sales representative, at right, is shown discussing approval of electrical control system with Mr. Don Thomas, assistant engineer of structures for Spokane, Portland and Seattle Railway; Mr. Glen Emory and Mr. Ed Bohm, partners of Emory and Bohm, electrical contractors.

Celilo Railway Lift Bridge uses new Westinghouse static skew control

When construction of the Dalles Dam caused the Columbia River to rise closer to the deck of the Oregon Trunk Railway's Celilo Bridge, it became necessary to build a lift span to let river traffic pass beneath. A Westinghouse d-c adjustable-voltage drive, incorporating static skew control, was installed to provide smooth acceleration and a precise regulating system to keep the span level.

Set between two towers, the span is counterweighted and suspended by wire ropes passing over sheaves at the top of each tower. Two Westinghouse d-c mill motors in each tower drive the sheaves and are electrically synchronized by the d-c adjustable-voltage system to keep the span level when operating. The various operations are so interlocked that they must follow a predetermined sequence to assure maximum equipment and personnel safety. The skew control equipment has safeguards against abnormal conditions and requires minimum maintenance.

Westinghouse equipment used on the Celilo Bridge includes: the main d-c drive motors, brakes, motor-generator, control regulating exciters, control board, an operator's console, emergency drive a-c gearmotors and a 225-kva outdoor power center.

Westinghouse, as sole supplier of the coordinated electrical system, assumed undivided responsibility for its overall operation. For further information showing how this complete, single-source supply can benefit you, contact your Westinghouse electrical construction engineer, or write: Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania. J-94116

Owner: Oregon Trunk Railway (Operated by Spokane, Portland & Seattle Ry.)
Consulting Engineers: Howard, Needles, Tammen & Bergendoff, Kansas City, Mo.
General Contractor: Kansas City Bridge Co., Kansas City, Mo.
Steel Fabricators: Pacific Car & Foundry Co., Seattle, Wash.
Electrical Contractor: Emory and Bohm, Portland, Oreg.
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Over 250 Pages Westinghouse Data in Sweet's Construction File.

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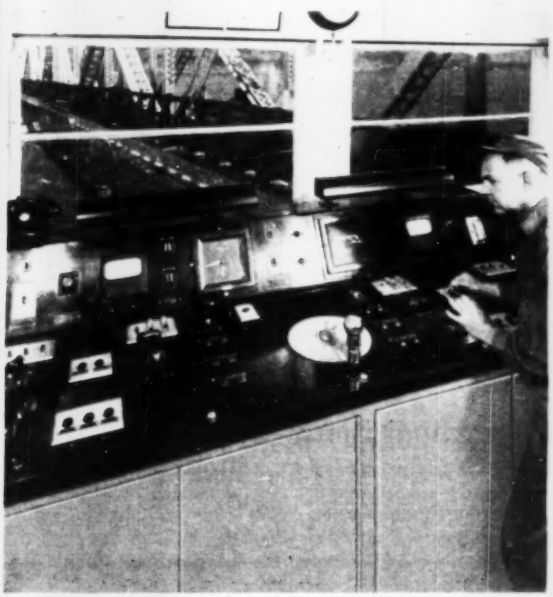
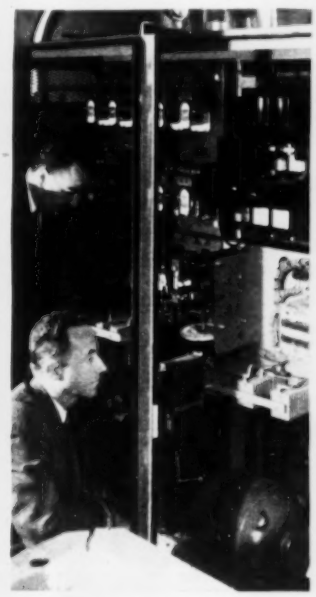


Chief operator, Champ King, at Westinghouse control desk. This desk centralizes the starting and stopping of railway traffic, selection of normal, auxiliary or emergency power supply, normal or emergency drive system and control of the lock and lift span.



Mr. Brown and Mr. Thomas inspect the interior of the main control cabinet which houses the Magamp* regulator panel and Rototrol* elements of the bridge control system.

*Trade-Mark

Mr. Bohm and Mr. Thomas examine the Westinghouse 33-hp Type MCA d-c mill motors, designed for heavy intermittent duty, which drive the main span machinery located at top of each tower.

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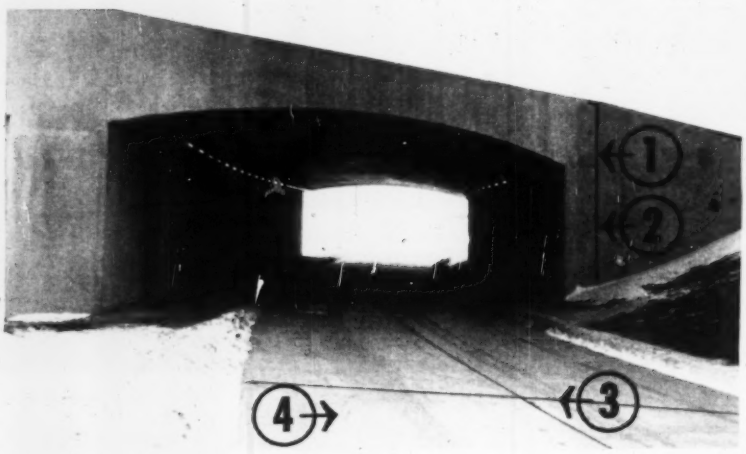

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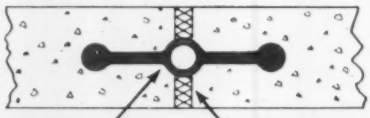

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A complete duplicate electrical drive system, including duplicate control elements, is provided for emergency operation. The operator can, if necessary, switch from one system to the other at any time during the operation of the span if there's an electrical failure in one of the circuits.

Power for normal operation of the lift span is supplied by a 4160-2400-volt, 3-phase, 60-cycle feeder from the west side of the channel. Emergency power can be supplied through a 340 kw diesel engine-generator set located in a generator room inside Pier No. 1.

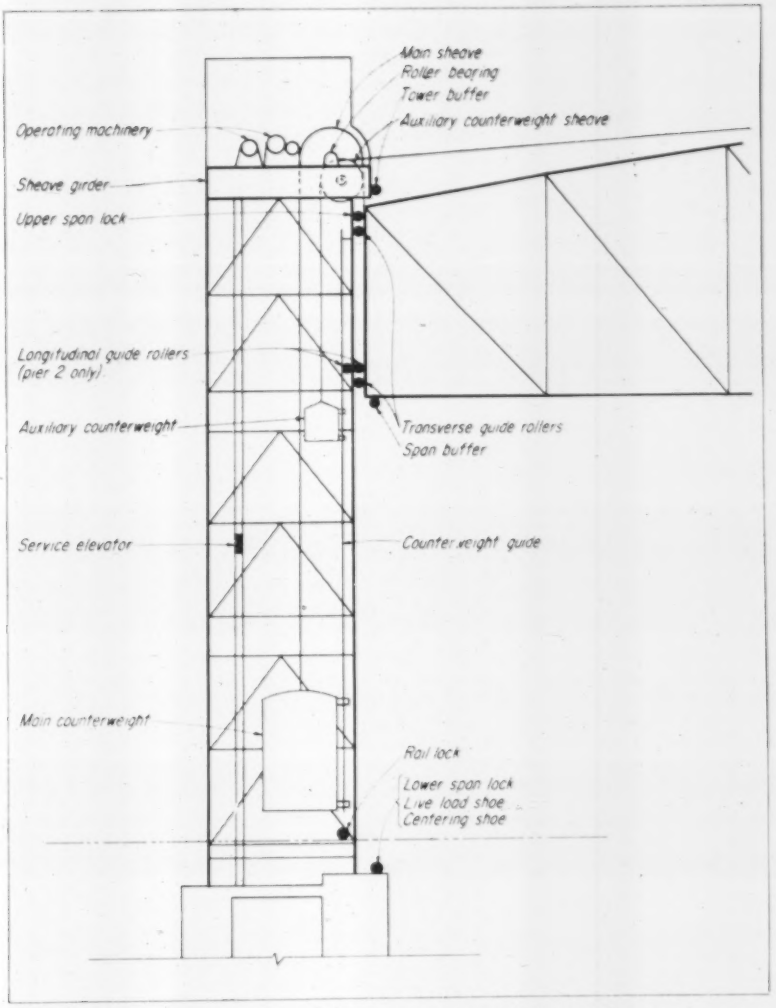
The electrical circuits in the two towers are connected by an aerial cable system that spans across the channel. The messenger cables carrying this system are suspended from brackets extending out laterally from the tower tops so the cables will clear the lift span in the raised position. This system was selected because the rock channel bottom and the existing bridge (which cannot be removed until the new lift span is in service) made the placing and proper protection of submarine cables impractical.

• Locks, guides and controls. When the span is raised to its full height, the four corners automatically trip latch mechanisms that lock the span in the open position. These locks must be released before the span can be lowered. In the lowered position, the span is locked down at all four corners by electrically operated plunger-type locks that engage slotted plates extended from the lift span.

As the span nears its fully seated position it engages a transverse centering shoe that lines up the rails on the span transversely with those on the tower. The lift span rails extend slightly beyond the span and are furnished with a device that automatically aligns the rails longitudinally. When the lower span locks have been driven, the rails are also locked together by electrically driven plungers. Tapered rail joints adjacent to the rail locks permit adjustment of the rails to the expansion and contraction of the lift span.

During its travel, the span is guided by cast steel rollers attached to it and engaging tracks formed by the edges of the front tower columns. Eight transverse guide rollers are provided—one at the top and one at the bottom of each of the four corners of the span. Longitudinal guide rollers are provided at the lower chord on one end only, to permit expansion at the other end. All longitudinal forces on the span are thus carried to the tower at the fixed end.

To prevent undue shock during seating, air buffers are provided on all four corners of the lift span. Similar buffers are mounted at the top of the tower to provide a smooth stop in case of overtravel when the span is raised.



TOWER COMPONENTS—counterweights are concrete-filled steel boxes.

Gear-driven limit switches are provided to slow the span automatically as it approaches the fully open and fully closed positions, to stop the motors when the span is fully seated, to control all indicating lights and navigation warning lights, and to control interlocking circuits. The navigation lights on the span will be red until the span is fully open. Then they will be turned to green through the operation of a limit switch. In addition to the lights, an audible signal is provided.

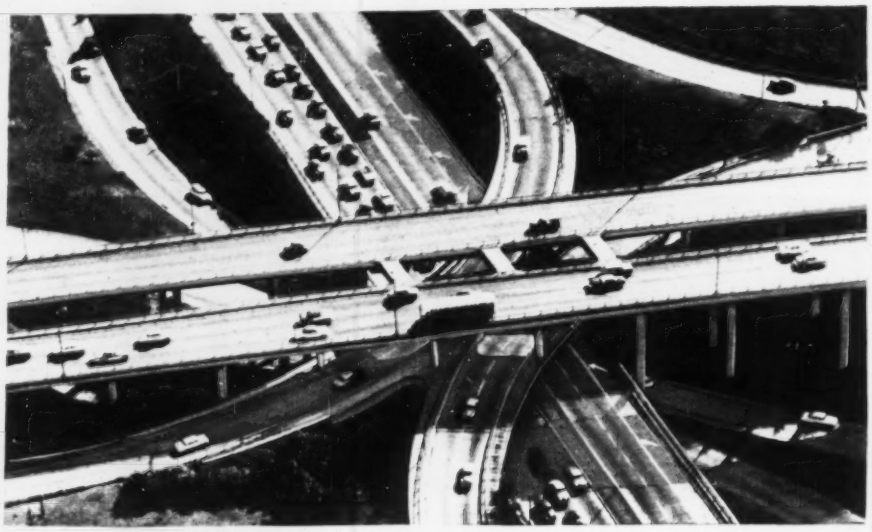
Rotating aerial beacons are installed on both towers and on the center of the lift span because of the proximity of the bridge to Newark Airport (about 2½ miles away). The maximum height of the top of the towers is 224 ft. above the water. An elevator is provided in each tower to facilitate inspection and maintenance of the machinery and electrical equipment at the tower tops.

The interlocking circuits are arranged so that the span cannot be operated unless the railroad signal system has been set against any oncoming trains, and no operation may be performed inadvertently by the operator that would damage any of the locking or control devices.

The design of the Arthur Kill Lift Bridge is a project of The Staten Island Rapid Transit Railway Co. Parsons, Brinckerhoff, Hall & Macdonald, as consulting engineers, prepared plans and specifications for the lift span, towers, main piers and fender system, and all electrical and mechanical features associated with the lift span and its control.

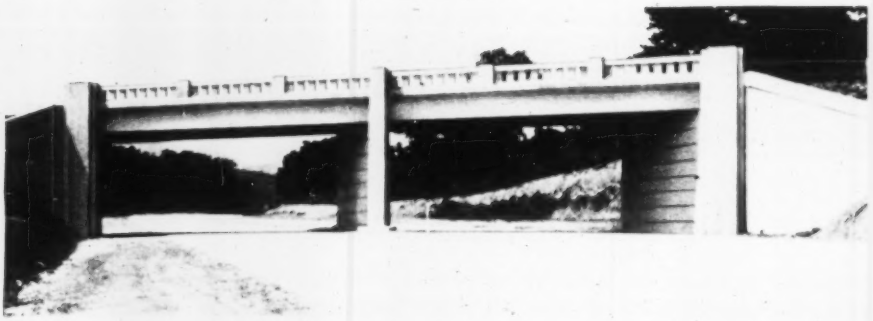
The work is now under construction, with Chas. E. Vachris, Inc., holding the contract for the substructure, and the American Bridge Division of the United States Steel Corp. as superstructure contractor. Construction is being supervised by the railroad.

Complex Interchange...



Four-level reinforced concrete Los Angeles Freeway separation structure

Or a Simple Bridge...



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Sea-water conversion plant supplies island with fresh water and power.

Biggest Desalting Plant Finished

The Dutch Caribbean island of Aruba celebrated completion of its newest sea-water distillery recently. Two old plants that have supplied the island for more than 20 years are being scrapped.

Biggest salt-water-conversion plant in the world, the installation can produce up to 2.7 million gallons of fresh water daily and up to 15,000 kilowatts of electricity. It cost $11 million.

Plant capacity is more than enough to supply potable water to the island's 55,000 inhabitants. Some water will be furnished to a local refinery, which supplies fuel oil for the desalting plant's boilers.

The Aruba plant embodies the submerged-coil, multiple-effect distillation process, in which hot vapor from each stage or effect gives up its latent heat to help evaporate water in the next effect before flowing to a fresh water collector.

The plant has six effects. It can produce 4.88 pounds of fresh water with each pound of steam; according to Singmaster & Breyer, of New York City, the engineering and construction firm that designed and built the plant.

Two boilers, one a standby, supply steam for the plant. Each has a capacity of 200,000 pounds per hour of steam at 875 lb per sq in. gage pressure and 820F. The evaporators supply distilled water for boiler makeup.

The high-pressure steam is fed to two turbo-generators, and turbine exhaust goes to the evaporators. The evaporators operate at 225F.

Singmaster & Breyer say that exclusive of distribution cost production cost has been tentatively estimated at $1.75 per 1,000 gallons of fresh water, but is expected to prove lower when exact costs reflecting power revenues become available.

A key item in the plant, according to the engineers, is special equipment that prevents salts in the concentrated brine from forming deposits on equipment surfaces. This equipment and the evaporators were furnished by G. & J. Weir, Ltd., of Glasgow, Scotland. Babcock & Wilcox, of New York City, supplied the boilers.

Iran Completes First Khuzistan Project

Iran's Plan Organization has placed in service its 75-mile 132-kva power transmission line between Abadan and Ahwaz. This is the first project to be completed in the Organization's extensive development plan for Khuzistan Province.

It is in this southwest region of the country, encompassing the nation's oil fields and its principal Persian Gulf port of Abadan, that the Plan Organization is centering its hopes for industrial development (ENR Sept. 25, 1958, p. 50).

Key facility in the program will be the 620-ft Dez arch dam and power plant, about 100 miles north of Ahwaz. An access road to the site is now under construction by Morrison-Knudsen International.

The transmission line, just completed, was undertaken as an interim measure to supply electric current to the coming industrial center of Ahwaz from the power plant at the Abadan oil refineries until power from Dez Dam becomes available. Costing $4 million, which was also the original estimate, the line was built in a scheduled 19 months by the Italian contractor, Societa Anonima Elettrificazione of Milan. The Development & Resources Corp., New York City, has supervisory charge of the entire Khuzistan program.

(International continued p. 48)

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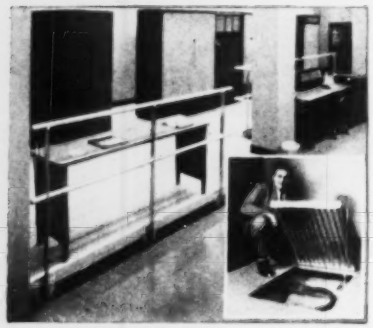

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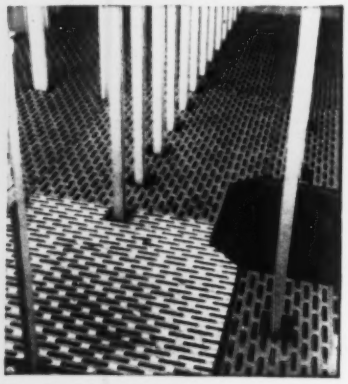

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Tokyo Opens Subway Line

Glittering stations and smooth new track went into operation recently when Tokyo opened its latest subway line.

The 11-mile-long line is a U-shaped route between the precincts of Ikebukuro and Shimjuku via downtown Tokyo.

Construction of the subway started in April, 1951. It took so long to build because of construction difficulties. One troublesome spot was near the Imperial Hotel, where the ground beneath the surface is half mud. Solution was to sink 28 caissons for a total length of 594 ft.

The subway bore is 19 ft high at center and 36.5 ft wide. It carries a double track of 4.6-ft-gage rails.

Teito Rapid Transit Authority built the new subway. It is the second trunk line to go into operation in Tokyo. The first, a 10.4-mile-long line was opened in 1927. Two other lines are under construction, another is being planned.

Yangtze will get a 2,700-ft bridge. Its one of . . .

Two Railway Bridges for China

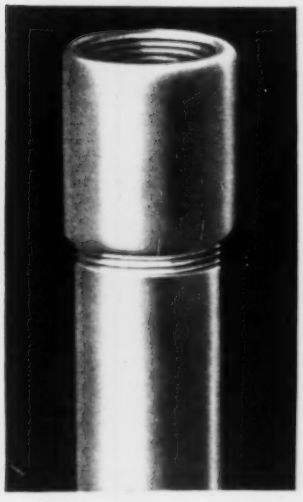
China has started a railway bridge across the Yangtze River (above) in the southwest and another across the Yellow River in central mainland.

There is a race at both sites to get piers above water level before the high water season starts.

Tubular column foundations are going in for the 2,700-ft-long Yangtze structure at Chungking.

The Yellow River crossing, 9,537 ft long, will be the longest bridge on the China mainland. It is going in just below an existing bridge at Chengchow.

First Security practices security by specifying **steel pipe.**



galvanized **steel pipe** fills a tall order

Dependable, economical, galvanized *steel pipe* is used for the drainage and vent lines in the new First Security Bank Building in downtown Salt Lake City. But for that matter it might be almost any other large building in Utah or in any other place in America. Because architects, engineers and contractors through the years have learned that they can depend on *steel pipe* for a lifetime of service wherever major construction is going up.

Generations of experience have shown engineers and contractors that low-cost *steel pipe* goes in easily and economically—provides lasting performance in soil, waste and vent lines. It's another example of the many kinds of jobs that *steel pipe* can do best.

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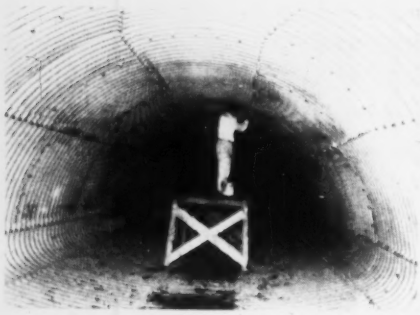
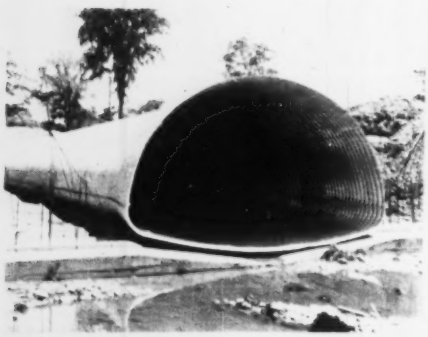


INTERIOR of completed Republic Sectional Plate Pipe-Arch is shown above. Installation is quick and easy. Structures can be installed with simple tools, unskilled labor. Only a minimum of excavation is required.



HEADWALL of reinforced concrete completed Rome, New York's drainage enclosure. When completed and backfilled, a structure such as this can eliminate maintenance and replacement worries for many years to come.

Flood-Spot Becomes Fun-Spot in Rome, New York

REPUBLIC SECTIONAL PLATE PIPE-ARCH MAKES STREAM VANISH

Once in Rome, New York, there flowed an unsightly, unwanted stream, with an unpleasant habit of overflowing its banks, creating a minor flood problem nearby. Today, the stream has vanished—whisked underground—and the surrounding "floodland" has become a pleasant recreational park. The pictures shown here illustrate how installation of Republic Sectional Plate Pipe-Arch helped to accomplish this transformation.

The stream was re-routed, and enclosed underground in a 391-foot Republic Sectional Plate Pipe-Arch with 15′ 10″ span, and rise of 9′ 10″. Six horizontal deflection angles were used to provide a 70° 15′ curve.

Installation was quick, economical, and efficient—with a minimum of disturbance to the city's daily routine. In addition to savings in time and money during installation, the structure will continue to pay dividends through years of trouble-free service.

Rome, New York's stream burial is but one of the many drainage problems which can be solved quickly and permanently by Republic Sectional Plate Pipe-Arch and other drainage products. To find out how these products can be used in your applications, simply contact the Toncan Drainage Products Manufacturer nearest you, or mail coupon at far right.

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Spokane, Wash.

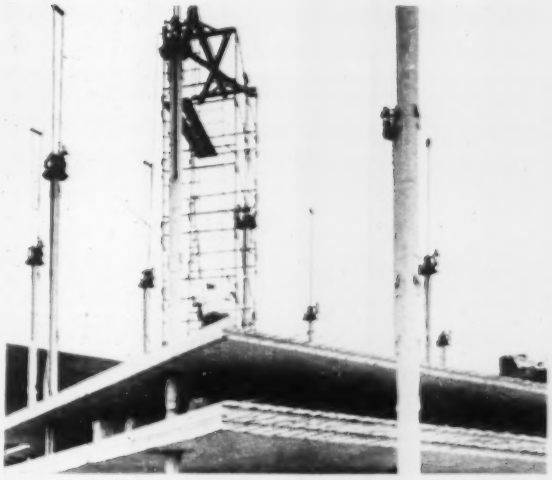
Thompson Pipe & Steel Company
Denver, Colo.

Tri-State Culvert & Mfg. Div.
Florida Steel Corp.
Tampa, Fla. • Decatur, Ga.

Utah Culvert Company
Ogden, Utah

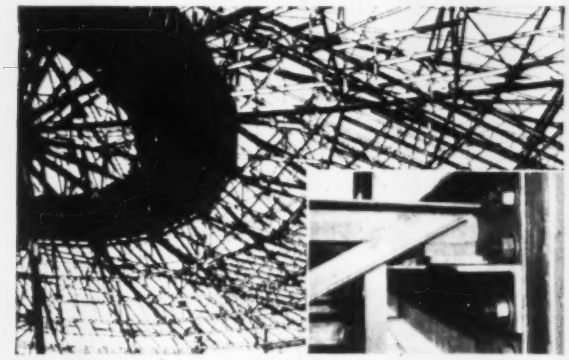
Wisconsin Culvert Company
Madison, Wis.

Wyatt Metal & Boiler Works
Dallas, Tex. • Houston, Tex.



TIME AND MONEY WERE SAVED when Republic Steel Pipe was used in erecting the Tremco Building, Cleveland, Ohio. Slabs were poured on ground, then gradually hoisted up 10¾-inch diameter pipe, by means of hydraulic screw jacks. Scaffolding, elevators, etc., were eliminated. Slabs were raised at a rate of 3' per hour. Mail coupon for details on Republic Steel Pipe.

SAVINGS IN FLOOR SPACE, with support for heavy loads, were obtained by using Republic High Strength Concrete Reinforcing Bars in Washington National Insurance Company Building, Evanston, Illinois. Columns using 11 No. 18S butt-welded high strength bars, with a possible design stress of 30,000 PSI, measure only 26" in diameter. Republic High Strength Reinforcing Bars provide a minimum yield point of 75,000 pounds per square inch and meet new ASTM Specifications A-431-58T. Mail coupon.



SAFE, STRONG CONNECTIONS are provided through use of Republic High Strength Bolts in dome of new Convention Arena, Detroit. High clamping force transfers loads to structural members by friction alone—an advantage that only high strength bolting provides. Installation is quick, easy, economical. Mail coupon for further details. (Giffels and Rossetti, Architects. R. C. Mahon Co., Structural Steel Contractor. General Contractor, O. W. Burke Co.)

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. EN-7872
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on:

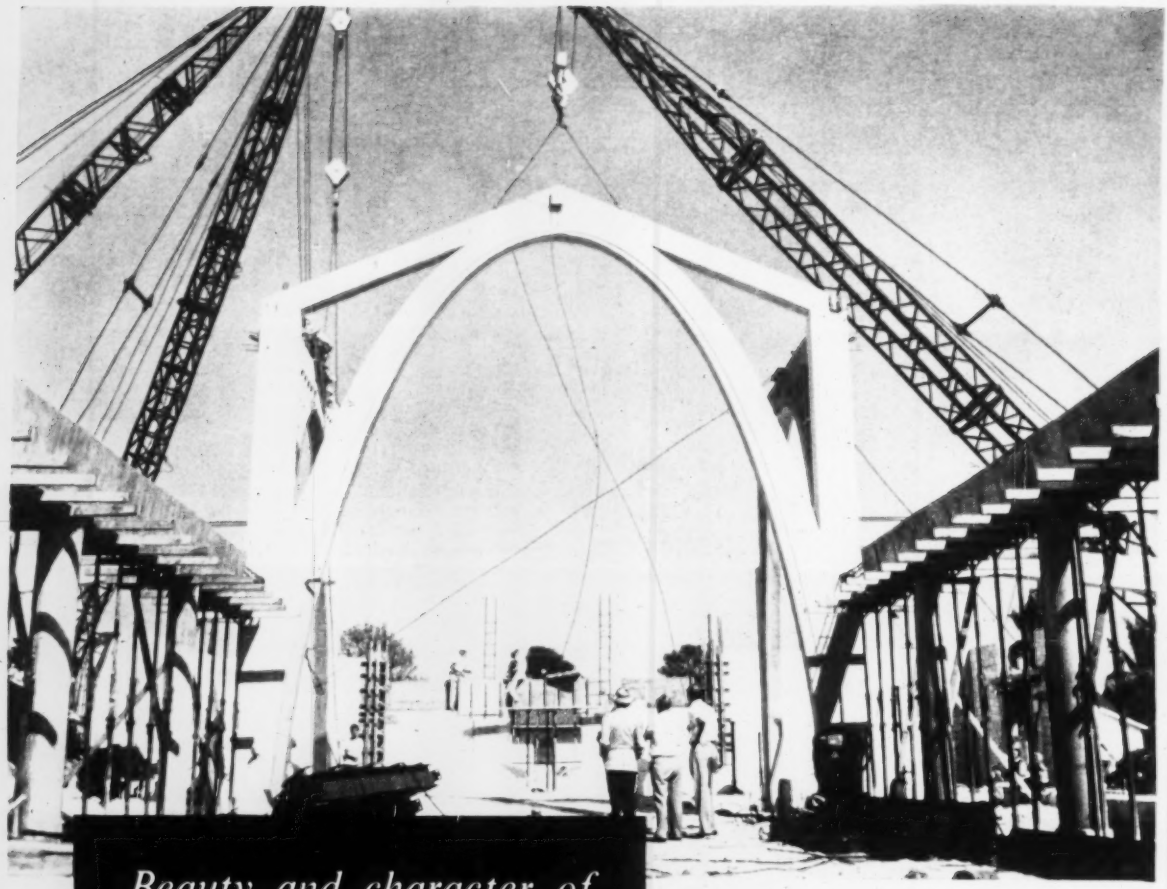
☐ Corrugated Pipe ☐ High Strength Structural Bolts
☐ Steel Pipe ☐ High Strength Reinforcing Bars

Name _____ Title _____

Firm _____

Address _____

City _____ Zone _____ State _____



Beauty and character of new church owe much to PRECAST CONCRETE

This church exemplifies the adaptability and beauty of modern precast concrete construction. Precast units serve both structurally and decoratively, and include 28 arches of varying sizes, 2 spire grills, 4 ornamental grills, and 42 precast window frames and sills. The largest arch is 32' high.

Architects-Engineers: T. Norman Mansell, Philadelphia, Pa.
Scott B. Arnold Assoc., Miami, Fla.
Contractor: Thompson-Polizzi Construction Co., Coral Gables, Fla.
Precast Units Supplied by: Lewis Manufacturing Co., Miami, Fla.

Soaring arches, ornamental grills, window frames and sills—all precast concrete—lend enduring beauty and character to the new St. Peters Lutheran Church, Miami, Fla.

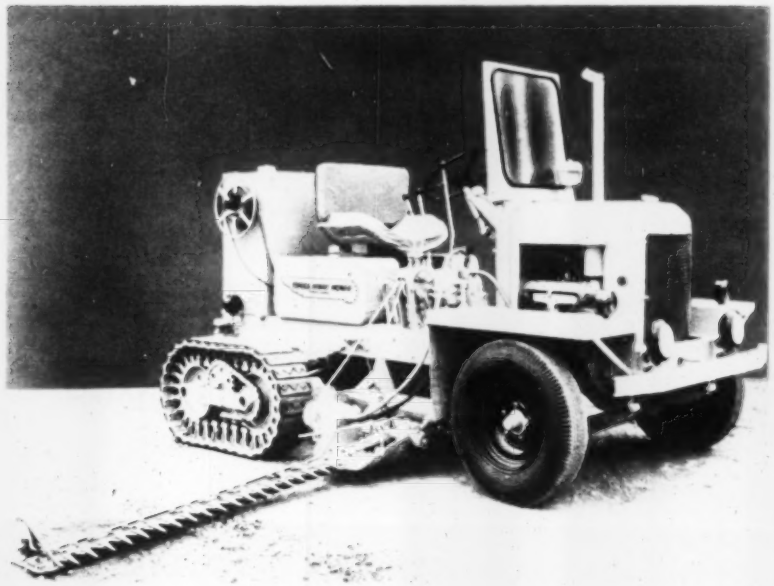
In precasting this wide variety of concrete units, Lewis Manufacturing Company used Lehigh Early Strength Cement for maximum production efficiency and economy.

"Our entire operation," writes Mr. Lewis, "has always been geared to the use of Lehigh Early Strength Cement and live steam curing. This fast production method enables us to give our customers better service, at lower cost."

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction.

Lehigh Portland Cement Company
ALLENTOWN, PA.

LEHIGH EARLY STRENGTH CEMENT • LEHIGH PORTLAND CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH MORTAR CEMENT



Mower Switches to Shoes

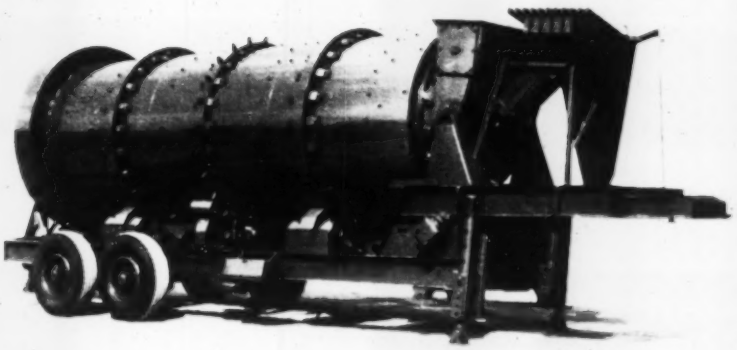
Changing from rubber-tired rear wheels to rubber-shoed crawlers is said to take less than an hour for Topeka's roadside mower.

Non-powered crawlers can also be substituted for the front wheels.

The crawler assemblies are designed to attain the same over-the-highway speeds as the wheels, up to 40 mph.

The mower has a 59-hp engine and two transmissions. One is for highway travel and the other for mowing at speeds from one to 10 mph.

Optional attachments include a chemical power sprayer, angledozer, power broom, front-end loader and all-weather cab. Topeka Hiway Mower, Inc., P. O. Box 720, Topeka, Kan.



Dryers Cover Wide Range

Three Barber-Greene aggregate dryers are designed to cover a capacity range from 60 to over 200 tons per hour. They are made to be used with any of the company's higher capacity continuous-mix or batch-type asphalt plants, or with those of other manufacturers.

All three models—DA-50, DA-60 and DA-70—are available on pneumatic-tired chassis with fifth-wheel towing

When time means money

. . . use Pittsburgh heavy-duty HIGH STRENGTH BOLTS

Good service and dependable shipment at all times. Readily available from stock, our bolts offer you these advantages . . . permanent clamping force—smooth fastening action—quick, easy, economic installation. Two-man bolting teams can use these bolts faster, more efficiently, with a greater degree of safety and less noise than any other method of construction. And, there's no fire hazard.

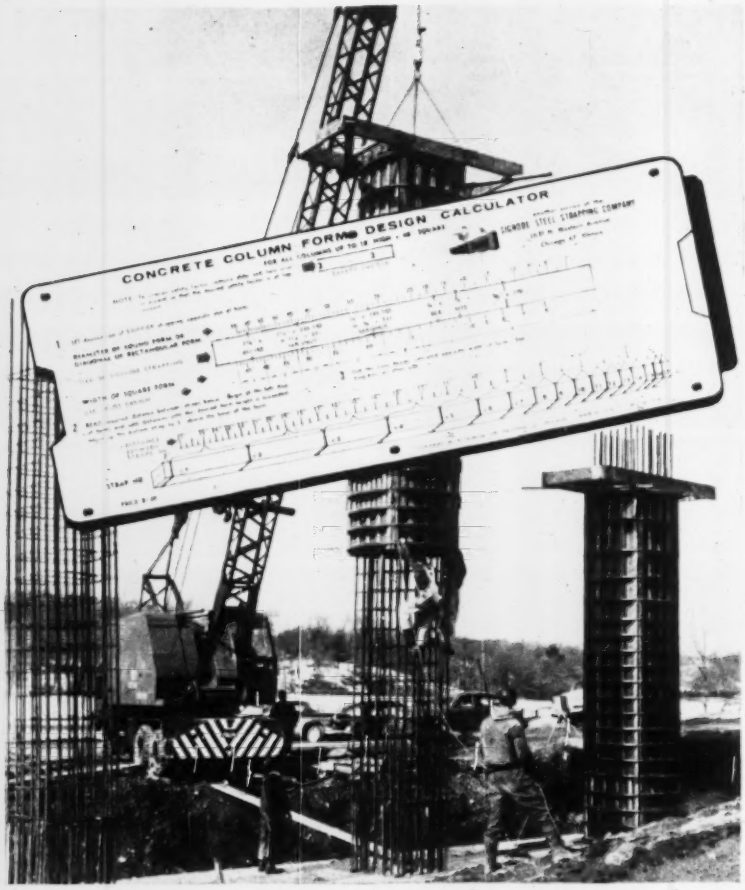
Remember . . . when time means money, use Pittsburgh heavy-duty high strength bolts.

SCREW AND BOLT CORPORATION OF AMERICA
P. O. Box 1708
Pittsburgh 30, Pa.

Formerly Pittsburgh Screw and Bolt Corporation

SERVES THE NATION

America's Most Complete Line of Industrial Fasteners



Minimize concrete column form costs ...Signode calculator shows how

The cost of designing, building and stripping concrete forms is a large factor in concrete construction costs. Now, you can reduce these costs sharply by using Signode's standardized column form designs. You save in these ways: by using proved simplified form designs; by faster assembly of forms; by faster stripping and less finishing time; by prefabrication in the horizontal; by needing only one man in most cases—Signode tools are designed for a single operator to work efficiently.

Signode's Calculator speeds column form design. It condenses strap size and spacing data for forms up to 65" diagonal or diameter and offers an option of safety factors up to 5. Six tested truss designs are shown.

A limited supply restricts these handy calculators to architects, contractors and engineers. The nominal charge of $1.00 assures prompt shipment of your calculator. Send your dollar now.

SIGNODE

SIGNODE STEEL STRAPPING CO.

2682 N. Western Avenue, Chicago 47, Illinois
Offices Coast to Coast:
Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

hitch, brakes and other equipment for over-the-road travel. Or they may be had without running gear for stationary installations.

The dryers feature a rotary inlet chute inclined at a 45 deg angle through which the cold aggregate is introduced into the drum.

A cradle chain drive to rotate the drum reduces the amount of chain needed and is designed to automatically compensate for drum misalignment, settling, expansion or contraction.

Lifting flights are of cupped and plate design. Self-adjusting dust seals are at the inlet and discharge ends. An air exhaust is provided by a duct atop the dryer. BARBER-GREENE, 400 N. HIGHLAND AVE., AURORA, ILL.

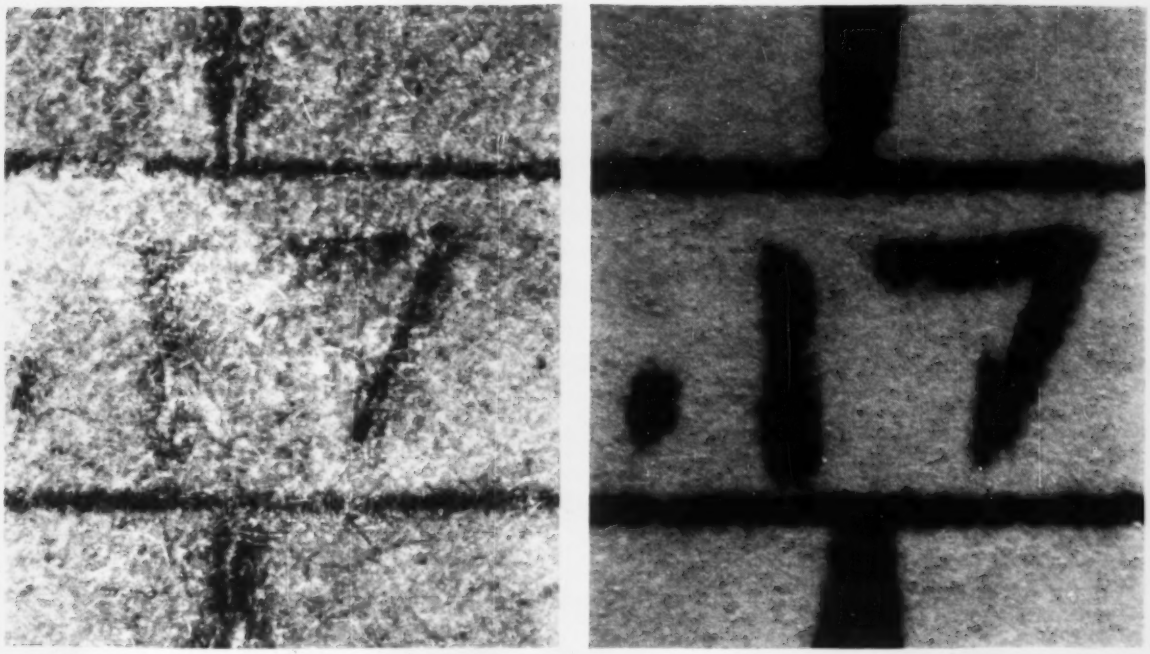
Briefs . . .

• **Vertical jet pumps**—The line of Rapidayton Jetstar Pumps now includes single-stage and two-stage vertical jet pumps. They are designed for 2-in., 2½-in. and 3-in. single-pipe wells. The single-stage model is available in ¾ and ½ hp and is designed for wells 20 to 80 ft in depth. The two-stage pump is equipped with ½, ¾ and 1 hp motors and is designed for wells as deep as 150 feet. TAIT MFG. CO., DAYTON, OHIO

• **Flexible piping**—For controlling waterline noises, isolating vibration, reducing water hammer and simplifying alignment problems in piping, a line of all purpose flexible rubber piping has been developed under the name Series R Flex-Hose. It is available with rubber and duck flanges or with standard brass fitted couplings. THE KORFUND CO., INC., 48-23M 32ND PLACE, LONG ISLAND CITY 1, N.Y.

• **Hand prism**—It is said to be easier to locate the target with an improved double-right-angle hand prism with a slotted handle. The instrument consists of two ground pentaprisms cemented together and protected by a two piece metal cover. The lower part of the hollow steel handle is grooved to accommodate a plumb bob. KEUFFEL & ESSER CO., HOBOKEN, N.J.

• **Sewer pipe gaskets**—A new line of gaskets for concrete pipe of all sizes is made of either rubber or neoprene. The gaskets are called TYTON C-P and TYTON C. They can be applied to the pipe at the job site or the pipe manufacturer's plant. Engineering data, diagrams and installation information will be furnished by the manufacturer. HAMILTON KENT MFG. CO., 427 WEST GRANT ST., KENT, OHIO.



These photomicrographs show effects of identical handling on (l.) a pencil drawing and (r.) an Autopositive Paper intermediate made from same drawing

Don't let your drawings smudge away!

JUST FILING a pencil drawing—and pulling it out of the files—will in time mess up your sharpest creation. *Make prints* from the drawing . . . use it for reference, and you speed the need for retracing, increase the possibility of reading errors.

It just doesn't make sense to watch your costly tracings smudge away when you can protect them for pennies per sq. ft.

Have your print room, or local blueprinter, make Kodagraph Autopositive Paper intermediates from your tracings. Put these Autopositives in your active drawing file—use them for reference in the drafting room and for all printmaking. Their dense black photographic line detail—on a white translucent paper base—will remain intact even after being used hundreds of times.

Autopositive Paper gives you positive intermediates directly. No special equipment or darkroom needed.

EASTMAN KODAK COMPANY
Graphic Reproduction Division, Rochester 4, N. Y.

Kodagraph Reproduction Materials

New booklet is jam-packed with valuable tips on saving drafting time, protecting drawings, getting better prints.

MAIL COUPON FOR FREE BOOKLET

EASTMAN KODAK COMPANY 67-6
Graphic Reproduction Division, Rochester 4, N. Y.
Gentlemen: Send me a free copy of your new booklet on Kodagraph Reproduction Materials.

Name _____ Position _____

Company _____ Street _____

City _____ Zone _____ State _____

Kodak TRADE MARK

2 ways you save money with a dependable

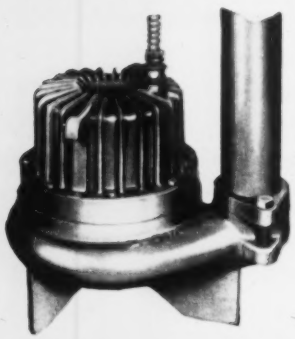
WEINMAN

immersible non-clog pump

The Weinman Type M pump easily handles liquids with large suspended solids while completely immersed. Yet, this compact, efficient pump saves you money two ways. You save on original cost . . . and you save again on installation cost. No pit cover or other special installation equipment is needed. Just lower the pump into the pit, connect the discharge line and waterproof lead cable. That's all. The pump is ready to handle sewage, drainage water and industrial waste.

Here's a bonus saving. Maintenance or the few repairs ever necesary can be made quickly and simply. All you do is disconnect the discharge pipe and lift the pump out of the pit.

It will pay you to get full information about the Weinman Type M pump. Write us for free bulletin No.1700. Or, call your Weinman Pump Specialist. He's listed in the Yellow Pages.



THE WEINMAN PUMP MFG CO.

290 SPRUCE STREET • COLUMBUS 8, OHIO

Centrifugal Specialists

Men and Jobs

Ricker Appointed to Head Pennsylvania Traffic Unit

Edmund R. Ricker, traffic engineer until recently of the New Jersey Turnpike Authority, has been appointed chief of the newly created traffic engineering division of the Pennsylvania Department of Highways.

The department is expanding its traffic bureau as a result of recommendations made by the Automotive Safety Foundation (ENR Sept. 4, 1958, p. 27).

Mr. Ricker, a civil engineer, was traffic engineer for New Haven, Conn., from 1948 to 1950. He is the author of a manual on parking that is used by many cities and states.

Under new departmental ruling, the head of the traffic division will report to the deputy secretary of highways for engineering. Previously, the traffic unit was responsible to the assistant chief engineer in charge of maintenance.

Kansas City Appoints An Acting City Manager

Reed McKinley, director of public works for Kansas City, Mo., since 1947, has been named acting city manager upon the resignation from that office of L. P. Cookingham.

His association with the city began in 1913 when he joined the Parks Department. After service in World War I he worked on drainage and flood control projects, on private and public projects in the city and for the WPA and PWA. He rejoined municipal service in 1940.

He is a past president of the Kansas City section of the American Society of Civil Engineers. As acting city manager, he will retain his post as director of public works.

Careers

Associations

Alfred A. Estrada, vice president and principal engineer for the firm of Albright & Friel, Inc., Philadelphia, has been elected president of the Philadelphia Section of the American Society of Civil Engineers.

Frank Ralph, assistant mechanical superintendent of the Anaconda Co., Butte, Mont., has been elected president of the Butte Chapter of the Montana Society of Engineers.

William F. Ryan, a former vice president of Stone & Webster Engineering Corp., will receive the 1959 National Society of Professional Engineers award for outstanding service to the engineering profession.

Business

Weldon W. Henderson and **Curtis H. Jochen** have opened a consulting engineering firm in Houston, known as Jochen & Henderson.

The Jerry Donohue Engineering Co., Sheboygan, Wis., and Robert J. Strass, Inc., Milwaukee, have merged. The joint operation is Hartman-Strass, Inc. of Milwaukee.

Russell P. Westerhoff has been appointed chief engineer of Ford, Bacon & Davis, Inc., New York City engineers and business consultants. **Stuart R. Fleming** has been named manager of the company's engineering department. Both are vice presidents.

Kenneth C. Cox has been elected vice president of Dravo of Canada Ltd. He previously served Dravo Corp., Pittsburgh, for more than 15 years.

Public Works

Lt. Col. Walter W. Hogrefe moves from Korea to become district engineer for the U. S. Army Corps of Engineers, Garrison District. He succeeds Col. Lynn W. Pine, who will be re-assigned to the Presidio, Monterey, Calif.

William D. Hiatt, former manager of the Tipton, Ind. municipal light and water system, has been named general manager of the West Lafayette Water Co., West Lafayette, Ind., succeeding the late Orril I. Williamson.

Col. Vincent P. Carlson becomes district engineer of the U. S. Army Corps of Engineers in Nashville, Tenn., this summer. He succeeds Col. Eugene J. Stann, who will be re-assigned to Asia.

Capt. Mark H. Jordan, Civil Engineering Corps, U. S. Navy, moves from his present post as director of the Seabee Division, Navy Bureau of Yards and Docks, to new duty at the Potomac River Naval Command as deputy public works officer. He relieves Capt. Edward A. Dadav, who has been named to the post of public works officer at the Treasure Island Naval Station in California.

Oliver A. Lewis, chief of the construction division of the Walla Walla District of the U. S. Army Corps of Engineers, has retired after more than 45 years in engineering and construction work.

Col. William F. Powers, district engineer for the U. S. Army Corps of Engineers at Philadelphia since 1957, has retired from active service to become deputy executive director for construction with the Lincoln Center for the Performing Arts, Inc., in New York City.

PARADE OF PROGRESS

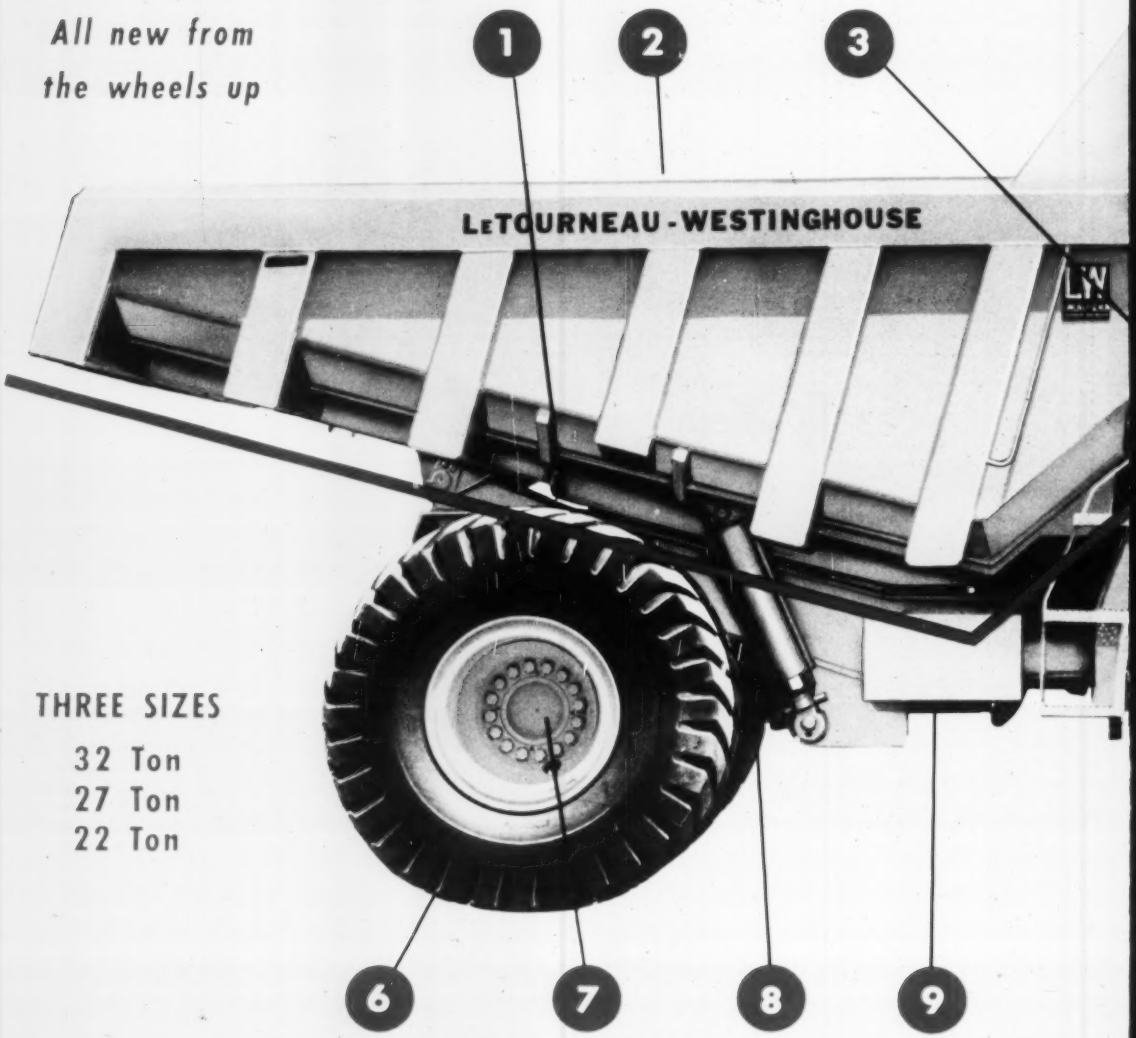
The first all-new off-road truck in a quarter-century...

Haulpak®

A PRODUCT OF LeTOURNEAU-WESTINGHOUSE

Haul more tons per man-hour with

All new from the wheels up



THREE SIZES

32 Ton
27 Ton
22 Ton

Look at these important advanced HAULPAK features...

1. **"V"-shaped body** — gives you bonus yardage within a short wheel base. Furthermore, with the LW wedge shaped body, loaded material quickly fills all corners for big low-void payloads. It also provides a low center of gravity . . . gives Haulpak the stability needed for high speed hauling over rough roads and steep grades.

2. **Low loading height** — (only 10'1" on the 32 ton size) and large top opening (14'5" x 11') makes it easy for shovel operators to load Haulpak fast, without spillage.

3. **Big, roomy cab** — with canted windshield has many work efficiency features.

4. **Strong, protective canopy** — covers cab completely.

5. **Positive power steer** — and sure-grip, auto-size steering wheel — for safe, easy handling. Steering system is located high behind bumper, protected from damage.

6. **Six big 18.00-25 tires** — for better traction and smooth, cushioned ride.

7. **Exclusive power-transfer differential** — automatically transfers power to wheel on firmest footing for maximum traction. This same, patented LW differential has boosted production and profits for thousands of LW Tournapull® owners for more than 14 years . . . and now, for the first time, it is available on a truck.

8. **Fewer moving parts** — between engine and wheels saves power and reduces maintenance costs. Haulpak's final drive has only six gears, compared to the twelve or more found in the normal big trucks.

9. **100% rubber-mounted body** — cushions loading shocks. Engine, transmission, radiator, and cab also rubber mounted to minimize vibration.

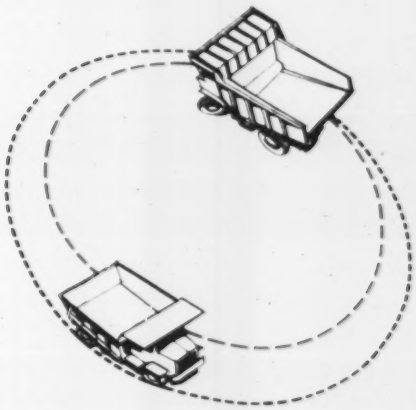
10. **Four separate braking systems** — for fast, safe, sure stops. System includes Torqmatic brake in the Haulpak transmission and big, disc-type air brakes on all wheels having four times the braking surface of conventional trucks.

11. **"Power-Miser" fan** — standard on all Haulpaks, requires only 10 hp to operate, compared with the 30 to 35 hp needed for conventional fans. Thermostatically controlled, fan shuts off automatically when engine heat falls below efficient operating temperature . . . permits engine to maintain correct temperature, releases more horsepower for tractive effort.

LW Haulpak

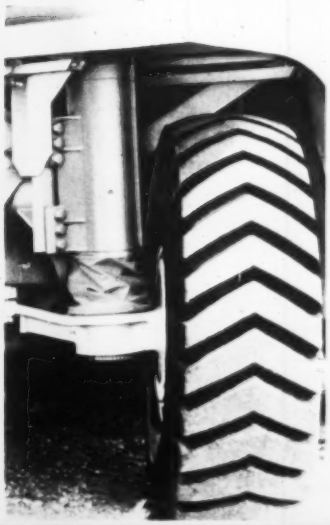
Hauls up to 30% more payload than its weight

With Haulpak, more horsepower is used to haul the payload, little is wasted hauling useless truck weight. Although light in weight, Haulpak is built exceptionally strong. Its body and box beam frame are constructed of high tensile strength steel ... nearly 3 times stronger than steel commonly used in trucks, yet it weighs $^{1}/_{3}$ less. Frame structural members also serve as air reservoirs for the operation of air brakes ... to further eliminate non profitable dead weight.



Turns in less space than the average pick-up

— with a wheelbase of only 130", Haulpak makes complete 180° turn in area only 44$^{1}/_{2}$' wide — far less than units of similar capacity. This unusual maneuverability permits Haulpak to spot, swing around, back up, and dump without lost motion to delay hauling cycles.



Has no springs . . . rides on Hydrair*

Haulpak's exclusive air-hydraulic suspension system completely eliminates maintenance and repair of springs. 4 Hydrair units cushion against loading and travel shock. System compensates automatically for off center loading and keeps unit riding level over humps and holes. Other Hydrair benefits to you: less dead weight, higher ground clearance. Hydrair cylinders fit close to wheels, up out of dirt and moisture.

*Trademark

Dumps in seconds — Twin 3 stage hoists lift body in seconds to a high 70° angle for fast, complete ejection of load. Body is exhaust heated to prevent materials from freezing and sticking. There's no "carry back" problem with Haulpak.

Needs NO daily maintenance — Haulpak's bearings never need lubrication ... they're moly coated to resist abrasion, packed in grease, and sealed for life. The entire Haulpak lubrication check — needed only at 500 hour intervals — consists of just 3 easily reached grease fittings. What's more, you can operate a big Haulpak fleet on a minimum parts inventory ... because final drives, Hydrair cylinders, wheels, and tires are interchangeable. Haulpaks work longer, harder, with less downtime ... give you more output per man hour.

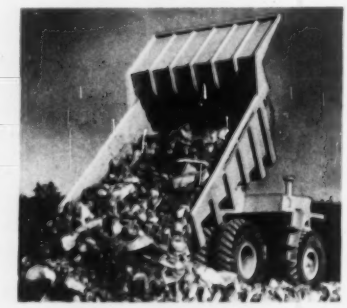
Already a fully-tested hauler

This all-new LW Haulpak is the result of more than 3 years of research and development by LeTourneau-Westinghouse engineers — pioneers of a long list of earthmoving and hauling equipment. All three Haulpak models have been put through rugged tests under the toughest working conditions for over 14 months — in mines, quarries, and on construction jobs. Its various parts and assemblies — some of them tested and proved by *millions of hours* on LW Tournapulls all over the world — are much stronger than those on ordinary haulers. With the new LW truck you can be confident your truck maintenance, repair, and operating costs will drop to a new low . . . and your hauling tonnage will climb to new highs!

Your nearby LeTourneau-Westinghouse Distributor can give you full details on the new LW Haulpak. And, as a specialist in the earthmoving and hauling field, he can help solve any other equipment or service problems you may have. His shop is well-equipped . . . parts stock is complete . . . and his factory-trained staff is ready to provide you with the best possible service, day or nite. Call on him soon!

Note easy-loading features of Model 27 Haulpak as it gets heaping load of overburden in this quarry.

Here, 38.8 mph Model 32 Haulpak "highballs" a big load of overburden at iron mine.



Another load of rock moved in a hurry! This Haulpak works for an eastern contractor.

LW PARADE OF PROGRESS

continues

The new Haulpak truck is the latest addition to an impressive array of new and improved earthmoving and hauling machines being unveiled by LeTourneau Westinghouse Company. They're part of LW's continuing program of product development to give you highest production equipment at lowest ownership operating cost.

CONDENSED SPECIFICATIONS

HAULPAK MODEL:	LW 22	LW 27	LW 32
Capacity			
Tons	22	27	32
Heaped, cu yd	24	27	30
Struck, cu yd	15	18	21
Power	320-hp 6-cyl. Cummins diesel	335-hp 6-cyl. Turbocharged Cummins diesel	375-hp 6-cyl. Turbocharged Cummins diesel
Speeds	Step-gear trans. Five forward speeds to 37.4 mph, two reverse to 3.6 mph	Power-shift trans. Four forward speeds to 35.4 mph, two reverse to 6.9 mph	Power-shift trans. Four forward speeds to 38.8 mph, two reverse to 7.5 mph
Dimensions			
Length	23'10"	23'10"	23'10"
Width	12'0"	12'0"	12'0"
Height	11'5"	11'5"	11'5"
Wheelbase	10'10"	10'10"	10'10"
Weight (lb)	40,820	43,020	44,950

(Specifications subject to change without notice)

Litho in U.S.A. HP 2100 G 4

LW

Where quality is a habit

LeTOURNEAU-WESTINGHOUSE COMPANY

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Obituaries

J. C. Lincoln, A. F. Davis, Welding Pioneers, Die

John C. Lincoln, 92, founder of the Lincoln Electric Co., Cleveland, died in Phoenix, May 25, and on the same day Alton F. Davis, 69, vice president and secretary of the company, died in Cleveland. Both men were among the early pioneers and promoters of electric welding. Both were also graduates of Ohio State University.

Mr. Lincoln, the holder of more than 50 patents in the electric motor and welder field, was president of the company until 1928 when he was succeeded by his younger brother, James F. Lincoln. He became chairman of the board, but devoted much of his time to real estate investment and to promoting the single tax theory.

Among his real estate holdings was the 45-story LeVeque-Lincoln Tower Building in Columbus, Ohio, and the Flamingo Hotel in Miami. Mr. Lincoln was awarded the Samuel Wylie Miller Medal of the American Welding Society in 1934.

Mr. Davis was hired by Mr. Lincoln on his graduation from college in 1914. When the James F. Lincoln Arc Welding Foundation Co. was created in 1936, he became its secretary, and administered the substantial awards the foundation has made for papers devoted to new developments in welding applications. The A. F. Davis Welding Library, which he established in 1942 at Ohio State University, is the largest of its kind in the world. Mr. Davis also started the A. F. Davis Welding Awards of the American Welding Society.

S. Bonsal Brooks, 70, vice president and general manager of Arundel-Brooks Concrete Corp., Baltimore. He joined Sanford & Brooks Co., a dredging and heavy construction company, in 1910. He was a vice president of that company in 1931, when he helped found Arundel-Brooks.

Dixon R. Schenck, 47, construction engineer for the Kingston Trap Rock Construction Co., of Kingston, N. J.

Joseph W. Edmondson, 57, retired chief engineer of the Elizabethtown district of the Kentucky Department of Highways. He was a member of the department for 32 years.

Jack Bonner, 38, president of the Contractors Equipment & Supply Co. of Oklahoma City, Okla. He died after being struck by a bucket of concrete at a construction site.

SOLID POWER

of a Remington concrete vibrator

You're looking at the business end of Remington's new Model EV-25 motor-in-head vibrator. Users say it's the best electric motor-in-head vibrator made, and Remington guarantees it for 6 months. The Model EV-25 is just one of 11 concrete vibrator models available from Remington. Ratings range from 1 to 6¼ hp in air, electric or gasoline-powered models. Interchangeable shafts, housings and heads enable equipment to be adapted to widely varying conditions. Mail coupon or write for performance data and specifications on the new Model EV-25 and the complete line of Remington concrete vibrators.

CHOOSE THE POWER MOST EFFICIENT FOR YOU. REMINGTON POWER TOOLS ARE AVAILABLE IN **AIR • ELECTRIC • GASOLINE AND POWDER-ACTUATED MODELS**

Remington

Remington Arms Company, Inc., Bridgeport 2, Conn.
IN CANADA: Remington Arms of Canada Limited, 36 Queen Elizabeth Blvd., Toronto 18, Ont.

DUPONT

FREE POWER TOOL CATALOGS EN-6

Remington Arms Company, Inc., Bridgeport 2, Conn.
Please send—without obligation—catalogs on Remington Contractor & Industrial Tools checked below:

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Company _____
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North Carolina Road Job

Cost of grading averages $78,150 a mile; of structures, $9.50 per square foot of roadway

Two contracts total $1,054,626 for this 9.13 miles of grading and highway separation structures on Interstate Route 85 between the South Carolina State line and Kings Mountain, N. C. Thirteen bidders competed for the grading contract, but the award at $691,336, by the North Carolina State Highway and Public Works Commission, Raleigh, went to William B. Dillard Construction Co., Sylva, N. C. It is 4.5% below the second bid and averages $78,150 a mile for the approximately 8.85 miles of road work.

Crowder Construction Co., Charlotte, on a bid 1.3% below the second and 17.3% below the high of the eleven bids, got the structures contract at $363,290. This averages approximately $9.50 a sq ft of roadway cost for these seven bridges:

No. of Bridges	Length	Roadway Width
1	250 ft 7 in.	24 ft
Dual, each	163 ft 5 in	28 ft
1	193 ft	24 ft
1	248 ft	24 ft
1	246 ft	28 ft
1	234 ft	24 ft

Minimum wages include: carpenter $1.60; ironworker, reinforcing $1.00; crane, derrick & dragline operator $2.00; unskilled laborer $1.00.

Grading Contract

1C Wm. B. Dillard Constr. Co., Sylva, N. C.	$691 336
2 A. B. Burton Co., Inc., Lynchburg, Va.	724 079
13 Ballenger Paving Co., Greenville, S. C.	1 045 631

Structures Contract

1C Crowder Constr. Co., Charlotte, N. C.	$363 290
2 Inland Bridge Co., Inc., Chester, S. C.	367 952
11 Dickerson, Inc., Monroe, N. C.	439 292

Bids: 1 20 59 Items	Unit	Quantity	Unit Prices 1C	2
Grading				
Clear	ac	62	$200 00	$200 00
Grub	ac	30	150 00	150 00
Exc, undcl	cy	1 574 000	0 25	0 25
drainage ditch	cy	6 000	0 50	0 75
Coarse agg base course	t	29 800	2 25	2 25
Bituminous surface treat	sy	13 500	0 35	0 35
Conc cl C, endwalls	cy	235	90 00	70 00
RCP, 15"	lf	844	30 00	40 00
18"	lf	13 628	3 50	3 15
24"	lf	2 392	5 50	5 50
30"	lf	596	7 50	7 25
36"	lf	616	9 00	10 15
42"	lf	452	12 00	13 20
30" ext str	lf	204	9 00	8 25
36" ext str	lf	124	12 00	13 50
42" ext str	lf	284	14 00	15 pg
flared end sect, 15"	ea	18	40 00	55 00
18"	ea	85	40 00	55 50
24"	ea	15	50 00	55 00
30"	ea	9	50 00	50 00
36"	ea	6	100 00	125 00
18", r&r	ea	11	25 00	30 50
24", r&r	ea	3	35 00	35 00
CMP culv, 6" spring	lf	300	1 50	1 50
bit ctd to B, 18"	lf	1 050	1 00	1 15
to B, 72"	lf	80	35 00	35 50
to B, 12 ga, 30"	lf	228	11 00	10 50
to B, 10 ga, 36"	lf	140	13 00	13 50
to B, 8 ga, 66"	lf	176	25 00	25 50
elbow, to B, 18"x30"	ea	18	40 00	40 00
Struct plate pipe, bit ctd				
to A, 10 ga, 60"	lf	1 736	30 00	35 00
to A, 8 ga, 66"	lf	132	40 00	42 50
to A, 12 ga, 60"	lf	136	30 00	35
Excavation, underdrain	cy	660	1 50	2 00
CMP, perf, 6" underdrain	lf	3 000	1 50	1 00
Agg matl, fine, underdrain	cy	450	6 00	5 00
Catch basins, brick msnry	cy	178	$80 00	$75 00
Conc, cl B, junct & spr box	cy	8	100 00	100 00
Fence, barb wire reset	lf	7 500	0 03	0 03
hog wire reset	lf	3 000	0 07	0 07
comb brb & hog w reset	lf	4 000	0 10	0 10
other reset	lf	3 000	0 25	0 25
Funnel, galv metal	ea	4	80 00	80 00
CMP, 8"	lf	130	2 50	2 00
elbows, 8"x30"	ea	4	20 00	20 00
Rt of way markers	ea	266	6 00	7 00
Coarse agg base course, for pipe beds	t	500	3 00	2 50
Wells drill	ea	2	1 500	750 00
capacity test	ls	job	300 00	300 00
Brass strainer, 6" f&t	lf	6	3 00	15 00

Completion schedule: 250 working days
Liquidated damages: $300 day

Structures				
Excavation, undcl struct	cy	1 160	$2 00	$1 00
Conc cl A, bridges	cy	2 103 9	52 00	58 00
culverts	cy	502 8	52 00	45 00
Steel reinforcing	lb	480 364	0 115	0 12
struct, approx 306,500 lb	ls	job	42 000	30 000
Piles, stl H, 12" at 53	lf	1 290	6 00	5 50
10" at 42	lf	780	5 00	5 00
prestr conc, 12"	lf	2 379	6 00	6 00
Girders, prestr conc, 45", 4,754 lf	ls	job	50 000	55 000
Conc slope protection, 4"	sy	2 380	3 50	4 50

Completion schedule: 300 working days
Liquidated damages: $200 cal day

Incinerator Access Road at Southbury, Conn.

This $19,240 award to E. J. Haverty, Inc., West Hartford, by the Connecticut State Highway Commission, Hartford, is for 612 lin ft of 18 ft wide bituminous treated crushed bank gravel surface, 8 in. deep, to provide access to the incinerator at the Southbury Training School, and for a 8.33x12 ft structural pipe arch.

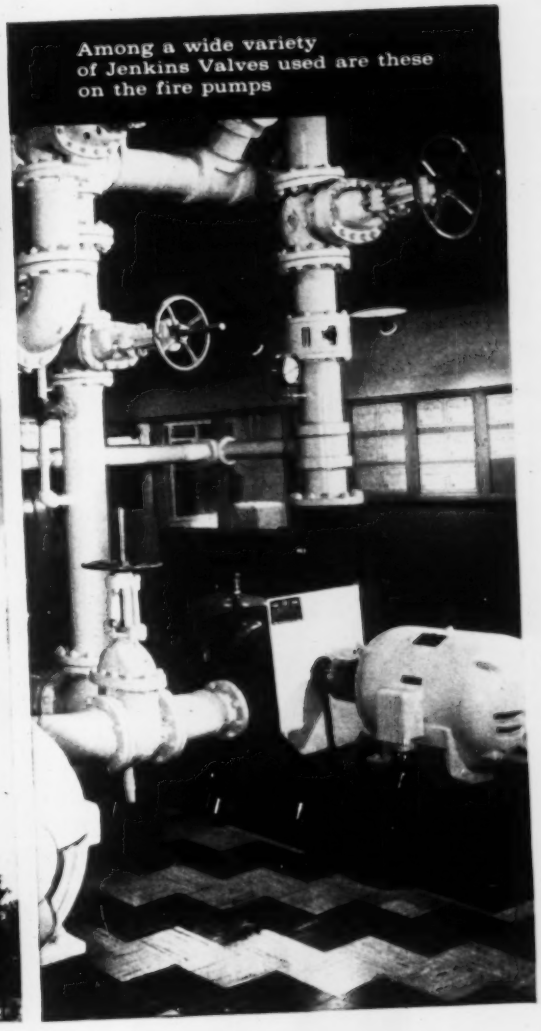
Wages include: crane & shovel operator, $3.50; grade operator $2.95; unskilled laborer $2.35.

The three low of eleven bids were:

1C E. J. Haverty, Inc., West Hartford, Conn.	$19 240
2 Carlson Constr. Co., Inc., New Milford, Conn.	19 793
3 Innes Bros., Inc., Thomaston, Conn.	20 391

Bids: 9 13 59 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, earth	cy	470	$1 00	$1 00
trench, 0-6' deep	cy	270	1 50	1 75
0-10' deep	cy	380	1 75	2 25
0-15' deep	cy	65	2 00	3 00
ditch	cy	25	2 00	2 00
Borrow	cy	400	0 50	1 25
RCP, 15"	lf	400	3 50	3 25
ACCM pipe, 15"	lf	90	4 50	4 00
Cor struct pl pipe-arch, 8 ga	lf	92	50 00	50 00
Catch basin, tp C	ea	1	200 00	225 00
over 10' deep	ea	1	250 00	250 00
tp C-G, over 10' deep	ea	1	300 00	350 00
Concrete, cl A	cy	17	60 00	60 00
Temporary crossing	ls	job	500 00	500 00
Superstructure, remove	ls	job	200 00	200 00
Gravel fill	cy	110	2 50	2 00
Subbase	cy	390	2 00	2 00
Formation of subgrade	sy	1 343	0 10	0 15
Rolled bank gravel surface	cy	325	2 50	2 00
Bit matl for surf treat	gal	1 550	0 15	0 15
Sand cover	sy	3 100	0 05	0 10
Paved ditch	sy	50	3 00	3 00
Guide rail, 2 cable	lf	660	2 00	1 50
Anchorage, tp C	ea	3	50 00	40 00
compensating type	ea	5	50 00	35 00
Single post	ea	10	2 00	2 00
Slope paving	sy	100	2 00	5 00

Completion schedule: 90 days. Liq. dam. $30 cal day



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Architects: NAESS & MURPHY, CHICAGO

General Contractor: GEORGE A. FULLER CO., CHICAGO

Plumbing and Sprinkler Contractor: M. J. CORBOY CORP., CHICAGO

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☐ House Construction ☐ General Building
☐ Engineering Projects (Heavy Construction)

Area _____

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

Materials and Labor Prices

Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, May 21; Next, June 18
- Clay Products, Lime, Plaster, Paint, Roofing: Last, May 28; Next, June 25
- Wage Rates, Building Board, Lath, Insulation: Last, May 28; Next, July 2
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, June 4; Next, July 9

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.50	$5.30	$5.675	$12.25		$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.50	5.30	5.675	12.25	$6.50	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.50	5.30	5.675	12.25	6.50	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.50	5.30	5.675	12.25	6.50	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.675	12.25	6.50	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.675	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.50	5.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	6.20	.....	6.375	.....	6.50	.....	.....	.....	9.75	6.875	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES: Per 100 lb. base price	STRUCTURAL SHAPES: Extras, New York:	REINFORCING BARS: Per 100 lb., base price; 5 tons to carload lot: New billet	REINFORCING BARS: Rail steel	REINFORCING BARS: Extras, New York:	EXPANDED METAL LATH: Per 100 sq. yd., carload lots: Std. diamond mesh 3.4 lb.	EXPANDED METAL LATH: Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING: Per 100 sq ft., carload lots fob mill
Atlanta	$9.40		$8.75	$8.75		$53.00	$57.00	
Baltimore	9.70		9.00f			44.50	49.00	
Birmingham	9.00v		8.90v	8.90v		50.00v K	76.00p K	87.04 / 81.62 / 81.17
Boston	10.01 K		8.75t	8.75t		49.50 K	54.00 K	
Chicago	9.15e		7.35e	7.35e		52.00 Ke	63.00 Ke	
Cincinnati	9.56ekt		9.04t			44.50 Kg	49.00mn Kg	
Cleveland	8.15ef		7.14ef			46.50 KL	51.00 KL	
Dallas	10.40M		9.00	9.00		44.00p	48.50e	
Denver	10.16e K		9.25e			63.00n	69.00n	
Detroit	9.50g 9.06M		7.15Q	11.85Q		55.00e	63.00e	
Kansas City	9.82eT		8.10S			49.00	60.00	
Los Angeles	8.90dez		7.35ez			61.00S	67.00S	
Minneapolis			9.26T	9.26T		44.50 K	49.00 K	
Montreal	7.90-8.80eCF	8.20-8.90dzF	7.00-7.50FGq	7.00-7.50FGq		65.70h	70.20h	
New Orleans			8.00gkz			48.50 K	53.50 K	
New York	9.84za		8.60q	8.60q		52.00n	56.00no	
Philadelphia	8.85-9.65zM		8.03-9.83zt			46.45z	48.52z	
Pittsburgh	9.00q		7.35q			48.00zw	52.00*w	
St. Louis	9.45dz		7.75zrQ	7.75zrQ		61.00wz K	62.00wz K	
San Francisco	9.95aS		9.00aS			52.00S	56.00S	
Seattle	10.20aD		8.85JM			67.00zn D	73.50zn D	
Toronto	9.20ff		7.85	7.85		46.00gzf	49.00 gzf	

EXTRAS, per cwt., ◆quantity: minima, under 1,000#, +$1.50; 2,000-4999#, +$1.00; 5,000-9999#, +50¢; 10,000-19,999#, +25¢; 20,000-39,999#, +10¢; 40,000-79,999#, ◆base; 80,000-99,999#, +10¢; 100,000-199,999#, +25¢; 200,000-299,999#, +50¢; 300,000-399,999#, +75¢; 400,000-499,999#, +$1.00; 500,000 & up, +$1.25. ◆Angles: 3" & over, 1/4" & thicker, +$1; 3" & over, 3/16" thick, +$2; 2½" & 2", 1/4" & thicker, +$2; 2½" & 2", 3/16" thick, +$3; 1½" & 1¼", 1/8" & thicker, +$3; 1½" & 1¼", 3/16" thick, +$4. ◆Beveling: heavy, +90¢; light, +$1.20. ◆Channels: 15" & 12", +$1.40; 10" & 9", +$1.00; 8", +75¢; 7", +90¢; 6", +$1.20; 5", +$1.40; 4", +$1.80; 3", +$2.50; 2½", +$3.10; 2", +50¢. ◆Bridging: heavy, +90¢; light, +$1.20. ◆Zees: 6" & 5", +$1.40; 4", +$1.80; 3", +$2.50; 2½", +$3.10; 2", +50¢. ◆Structural shapes in New York City and surrounding metropolitan area where bridging must be done on the job: ◆Beveling: heavy, +$1.20; light, +$2.20. ◆Channels: 15" & 12", +$2.20; 10" & 9", +$1.80; 8", +$1.40; 7", +$1.20; 6", +$1.00; 5", +90¢; 4", +75¢; 3", +50¢; 2½", +40¢; 2", +30¢. ◆Angles: 3" & over, 1/4" & thicker, +$1.20; 3" & over, 3/16" thick, +$2.20; 2½" & 2", 1/4" & thicker, +$2.20; 2½" & 2", 3/16" thick, +$3.20; 1½" & 1¼", 1/8" & thicker, +$3.20; 1½" & 1¼", 3/16" thick, +$4.20. ◆Zees: 6" & 5", +$2.20; 4", +$2.60; 3", +$3.30; 2½", +$3.90; 2", +$1.30. ◆Bridging: heavy, +$1.20; light, +$2.20. Extras, New York: Quantity extras, per cwt., under 100 tons, +$10.100-399, +$5.400-999, +$3.1000-1999, +$2.2000-3999, +$1.4000-9999, base.10,000-19,999, -25¢.20,000-39,999, -50¢.40,000-79,999, -75¢.80,000 and up, -$1.25. Minimum charge $25. Detailing: allow 10% for detailing from design by others; over 500 tons, +15¢; 200-499 tons, +25¢; 100-199 tons, +50¢; 50-99 tons, +75¢; 20-49 tons, +$1.00; 5-19 tons, +$2.00; 1-4 tons, +$3.00; under 1 ton, +$5.00. Fabricating: allow 25% for fabricating; over $1500, 5-19 tons, +$2.00; 1-4 tons, +$3.00; under 1 ton, +$5.00. Delivery: 20-74 tons, +75¢; 5-19 tons, +$1.00; 1-4 tons, +$2.00; under 1 ton, +$3.00. Minimum charge $25. Domestic only: +50¢ per cwt. Extras, New York: Reinforcing: detailing and placing from design by others: over 500 tons, +15¢; 200-499 tons, +25¢; 100-199 tons, +50¢; 50-99 tons, +75¢; 20-49 tons, +$1.00; 5-19 tons, +$2.00; 1-4 tons, +$3.00; under 1 ton, +$5.00. Fabricating: allow 25% for fabricating; over $1500, 5-19 tons, +$2.00; 1-4 tons, +$3.00; under 1 ton, +$5.00. Delivery: 20-74 tons, +75¢; 5-19 tons, +$1.00; 1-4 tons, +$2.00; under 1 ton, +$3.00. Minimum charge $25. Domestic only: +50¢ per cwt. Extras, New York: Reinforcing: detailing and placing from design by others: over 500 tons, +15¢; 200-499 tons, +25¢; 100-199 tons, +50¢; 50-99 tons, +75¢; 20-49 tons, +$1.00; 5-19 tons, +$2.00; 1-4 tons, +$3.00; under 1 ton, +$5.00. Fabricating: allow 25% for fabricating; over $1500, 5-19 tons, +$2.00; 1-4 tons, +$3.00; under 1 ton, +$5.00. Delivery: 20-74 tons, +75¢; 5-19 tons, +$1.00; 1-4 tons, +$2.00; under 1 ton, +$3.00. Minimum charge $25. Domestic only: +50¢ per cwt.

4" x 18 in., No. 5 & 10 wires—Joliet, Ill.; Duluth, Pa.; Monessen, Pa.
4" x 12 in., No. 8 & 12 wires—Joliet, Ill.; Duluth, Pa.; Monessen, Pa.
6" x 8 in., No. 6 & 6 wires—Joliet, Ill.; Duluth, Pa.; Monessen, Pa.

●† Delivered. ●** Aver. of Canadian & American. ●a 2000-9999#. ●b 10,000-15,999#, fob city. ●c 20 tons or over. ●d 10,000-29,999#. ●e Intermediate struct'l. ●f Incl. delivery in free zone. ●g CL. ●h list price; dominion tax exempt; add provincial and municipal taxes. ●i add provincial and municipal sales taxes. ●j intermediate and hard grade. ●k fob city ●l delivered; contractor to do unloading. ●m copper alloy. ●n LCL. ●o asphalt coated. ●p 500 sq. yd. or more. ●q 2.5 lb. ●r less 2% disc. for cash. ●s 2,000-4,999#. ●t less 1½% disc. 10 days. ●u add 7.5¢ switch. ●v incl 15¢ del. ●w truck lots. ●x add 2% sales tax. ●y add 15¢ del. ●z add 10¢ del. ●A American made. ●C Canadian made. ●D 1½% for cash. ●E 30,000- or over. ●F Federal tax exempt for bldgs. ●G add 10¢ del. ●H 8.85 without tariff charges. ●I 3 th $60.00. ●J 4 th $47.50. ●K less 2% disc. 10 days. ●L F.o.b. Youngstown plant. ●M 5,000-9,999. ●N 2,000-19,999. ●O 100 sy lots. ●Q 5 tons to CL. ●R: revised. ●S less 2% disc. 10th. ●T less 1% disc, 10th of mo. ●U less 2% disc 10 days.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C.I. PIPE PRICE INDEX‡	ASBESTOS CEMENT PIPE Z per lin. ft. 6" Press Cl. 150	ASBESTOS CEMENT PIPE Z per lin. ft. 12" Sew Cl. 1500	CLAY SEWER PIPE Per ft., delivered, car load ASTM C13-54 8 in.	CLAY SEWER PIPE Per ft., delivered, car load ASTM C13-54 12 in.	CLAY SEWER PIPE Per ft., delivered, car load ASTM C200-55T 24 in.	CLAY SEWER PIPE Per ft., delivered, car load ASTM C200-55T 36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 6 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 8 in.	CONCRETE SEWER PIPE† Per ft., delivered ASTMC 14-55 12 in.	CONCRETE SEWER PIPE† Per ft., delivered ASTMC 14-55 24 in.
Atlanta	130.5	$1.61 1.69	$2.36 2.48	$0.55	$1.00	$4.50	$12.50	$209.00x	$334.00	$0.92m K	$3.65m K
Baltimore	140.1	1.61 1.69	2.19 2.30	665	1.20	5.05	12.71	187.80	289.20	1.01	2.75
Birmingham	125.8	1.61 1.69	2.26 2.37	56e	90e	4.60ev	11.03ev	296.00ez	433.00ez	1.25eS	2.75eS
Boston	143.1	1.63 1.71	2.19 2.30	784eqtL	1.512eqtL	6.255eqtM		215.40e	330.60e	1.56S	3.42S
Chicago	140.9	1.61 1.69	2.19 2.30	93me	1.25me	7.52me	21.16me	220.00Dfe	330.00Dfe	1.30	4.00
Cincinnati	135.5	1.63 1.71	2.19 2.30	665e†	1.262e†	4.905e†	12.505e	240.00e	3.70.00e	85e4B	3.25e4B
Cleveland	141.7	1.63 1.71	2.19 2.30	602HCV	1.215efHC	4.72HC	12.505HC	155.40mfHC	240.60mfHC	1.35	3.60F
Dallas	137.8	1.63 1.71	2.26 2.37	550ZH	965ZH	4.40ZH	9.752ZH			1.25BD	2.85BD
Denver	148.2	1.71 1.80	2.36 2.48	52ne	96ne	3.92ne		360.00ne	580.00ne	1.05m	3.50m
Detroit	142.1	1.61 1.71	2.19 2.30	60mk	1.20mk	6.80mk	18.56mk	182.00mk	260.50mk	1.10k	4.05k
Kansas City	138.5	1.61 1.71	2.26 2.37	61e	1.10Se	5.10Ke	16.56e	303.00e	581.00e	95e	3.25e
Los Angeles	148.6	1.70 1.79	2.19 2.30	52S	1.25OS	7.10OS	16.00OST	410.00S	500.00S	1.24eE	3.66eE
Minneapolis	149.9	1.67 1.75	2.26 2.37	93eB	1.67eB	7.39eB				2.19DEH	6.31DEH
Montreal				1.13w	2.00w	7.00w	13.50w	288.00	545.00	1.17D	3.11pD
New Orleans	133.3	1.61 1.69	2.26 2.37	52Se	0.98Se	5.43e		210.50pe	468.00	1.41e	3.76e
New York	138.5	1.63 1.71	2.19 2.30	1.02	1.49B	7.58	19.48			1.50tB	3.60B
Philadelphia	137.8	1.61 1.69	2.19 2.30	68z	1.31z	5.13z	14.25z	300.00z	350.00z	1.75zA	4.20zA
Pittsburgh	142.9	1.63 1.71	2.19 2.30	602	1.16	8.14	22.73	190.00	295.00	1.66Dfz	3.93DB
St. Louis	136.9	1.61 1.69	2.26 2.37	62e	1.15e	4.92e	12.08eS	200.00e	400.00e	1.50e	3.65
San Francisco	148.6	1.70 1.79	2.19 2.30	56Sd	1.50Sd	7.53Sd	18.00Sd	360.00Sz	620.00Sz	1.05SQ	3.30SQ
Seattle	149.0	1.71 1.80	2.19 2.30	55Se	1.30Se	7.61e		250.00Sfe		1.95eg	4.55eg
Toronto				50F	1.50F	6.00F		157.00F	280.00F	1.05F	4.62F

Mill	WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote: Black %	Galv. %	Butt Weld* 2" & 3 in.	Lap Weld* 2½" & 3 in.	Butt Weld* 4" to 6 in.	Lap Weld* 4" to 6 in.	Butt Weld* 8" to 12 in.	Lap Weld* 8" to 12 in.
Lorain, Ohio	13	5						
Aliquippa, Pa.	13	5						
Sharpsville, Pa., Md.	17	20						
Benwood, W. Va.	13	5						
Youngstown, O.	13	5						
Indiana Harbor, Ind.	12	75						
Sharon, Pa.	13	5						
Wheatland, Pa.	13	5						
Etna, Pa.	13	5						
Fontana, Calif.	0	5						

Mill	WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote: Black %	Galv. %	Butt Weld* 2" & 3 in.	Lap Weld* 2½" & 3 in.	Butt Weld* 4" to 6 in.	Lap Weld* 4" to 6 in.	Butt Weld* 8" to 12 in.	Lap Weld* 8" to 12 in.
Lorain, Ohio	13	5	50	50	50	50	50	50
Aliquippa, Pa.	13	5	50	50	50	50	50	50
Sharpsville, Pa., Md.	17	20	50	50	50	50	50	50
Benwood, W. Va.	13	5	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1
Youngstown, O.	13	5	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1
Indiana Harbor, Ind.	12	75	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1
Sharon, Pa.	13	5	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1
Wheatland, Pa.	13	5	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1
Etna, Pa.	13	5	+ 1	+ 1	+ 1	+ 1	+ 1	+ 1
Fontana, Calif.	0	5	+ 15	50	50	50	50	50

* Threaded and coupled, ea 21/2 to 4 in. weld, c to 1 5 and 6 in. 15 in.

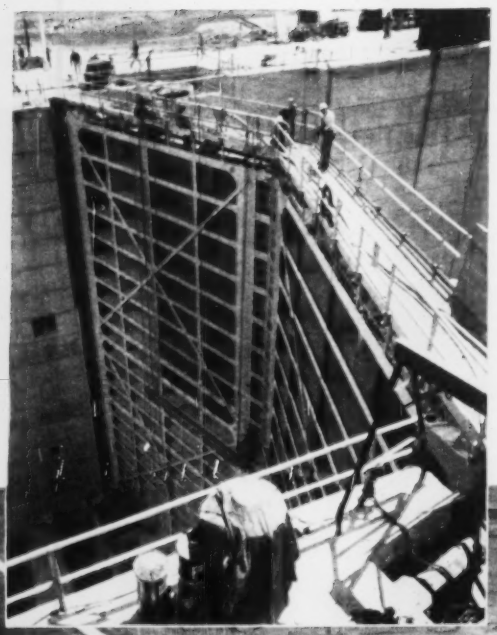
‡ Extra quality. ●§ Extra strength. ●** delivered. ●x PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE. Include carload freight allowed to city. These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala.: 125.8; Burlington N. J., 134.6. ●b Extra strength. ●c 4-in., $130. ●d SS361-A. ●e 21 in. ●g culvert pipe; reinf., ASTM C 75 56. ●h reinf., ASTM C 75 54. ●i reinf., ASTM C 76 55. ●j centrifugal. ●k less 2% disc. for cash. ●l fob plant. ●m truck del. ●n LCL del., fob truck. ●o less 5% disc. 10th. ●p freight allowed to destination in city. ●q 35,000 minimum. ●r less 2% disc. 10 days. ●s 1 ft lengths. ●u CSA A 60. ●v standard strength. ●w SS; add 20% for d.s. ●x fob city. ●y Reinforced. ●z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. ●A single strength. ●B truckload. ●C less 2% disc. 15th. ●D ASTM 76 57. ●E less 1% disc. 10 days. ●F less 2% disc. 30 days. ●G LCL. ●H CL. ●I fob origin, freight allowed. ●J reinf. B14 15. ●K Less 2% disc. 15 days. ●L ASTM 13 57. ●M ASTM 200 57. ●N 2 ft. lengths. Trucklots. ●O add 2% Sales Tax. ●P 18 in. ●Q less 1% disc. 10th. ●S ASTMC 72, 12" 1.55, 24" 4.00. ●T extra strength.

*** WROUGHT STEEL PIPE:** Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.(*based on approx. $200 per net ton): Butt Weld ¼ in., 8½¢; ⅜ in., 8¢; ½ in., 8¢; ¾ in., 8½¢; 1 in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 78½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92, continuous weld same as lap weld prices. Add freight, 3% transport tax for destination price. † Production discontinued November 1957.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld .1 in. black, + 68.54, galv., + 95.77; 1¼ in. black, + 65.54, galv., + 95.23; 1½ in. black, + 61.79 galv., + 91.22; Lap Weld 2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 6 in. black + 64.74 galv. + 90.68. Add freight rates plus 3% transportation tax to get destination price.

STEEL-WELD FABRICATION . . .

STEEL COMPONENTS for Heavy Construction Projects!

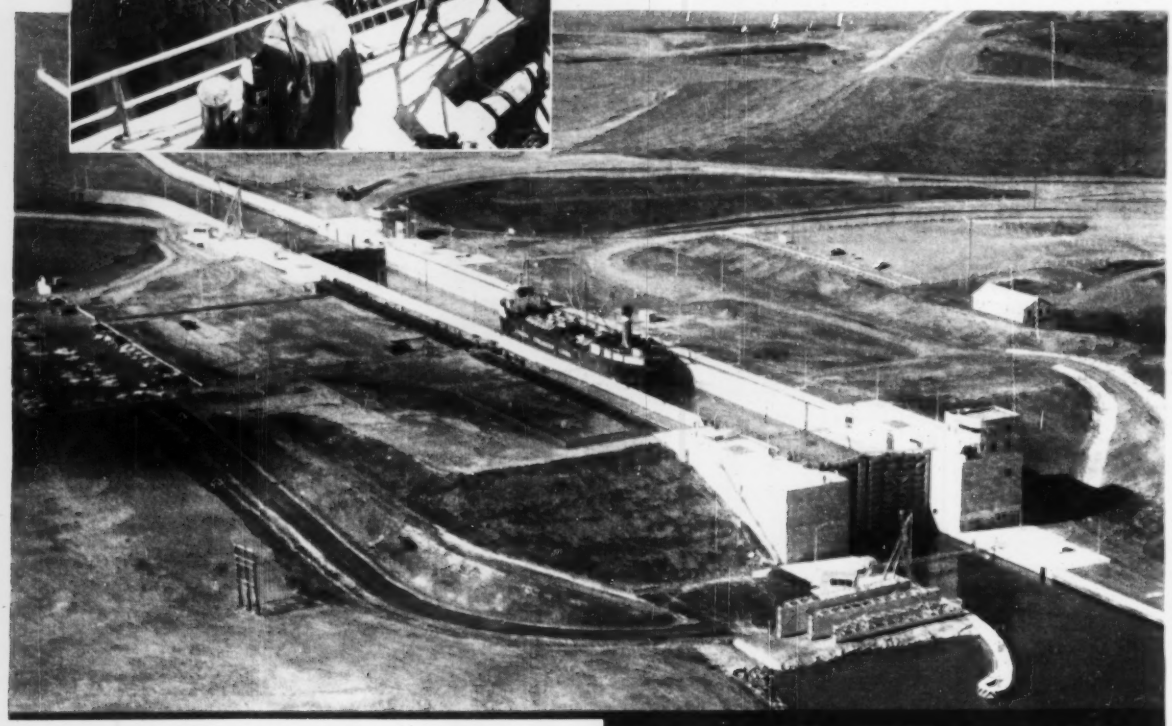


The 85 Ft. high Miter Gates, shown at left, are part of the Lock Mechanism of the St. Lawrence Seaway. The Mahon Company fabricated all the Miter Gates and a 390-Ton Vertical Lift Gate for the Dwight D. Eisenhower Lock, and the Miter Gates for the Bertrand H. Snell Lock—these are the upper two locks at the Lake Ontario entrance of this great international seaway.

When you need fabricated steel components for Locks, Dams, Bridges, Highway or Power Projects, you will find in the Mahon Company a unique source for heavy steel plate and structural steel units in either welded or riveted construction . . . a fully responsible source with unusual facilities for fabricating, machining, handling and erecting; and a long and enviable performance record covering a period of more than thirty-five years in this field.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO



Aerial View of the Dwight D. Eisenhower Lock at Massena, N. Y. Inset is a close-up of the Miter Gates at the lower end of the Lock. Each Section of these Gates, which are 85 Ft. high, weighs 261 Tons.

MAHON

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ Mass., Boston—BA 6-18—Commonwealth of Mass., Metropolitan Dist. Comm., Constr. Div., 20 Somerset St., Boston, Constr. 274, constr. Deer Island Sewage Treatment Plant, $1,500,000. Plans deposit $25.

BUILDINGS—BA

▲ Conn., Cheshire—SEMINARY—BA 6-16—Our Lady of Lafayette Missionaries, Topsfield Rd., Ipswich, Mass., 4 story, 135,000 sq. ft. steel frame, concrete brick and masonry preparatory seminary, Main Ave., $1,400,000. Plans deposit $100. Sebastian J. Pasquerella, 264 Court St., Middletown, archt., Ernest S. Dubin Assocs., 178 S. Whitney St., Hartford, engrs. CD 4-20.

BUILDINGS—LB & CA

▲ A. F. Peaslee, Inc., 57 Lewis St., Hartford, Conn., CA $2,024,406, BUSINESS ADMINISTRATION BLDG. and LIBRARY, Hartford Ave., HARTFORD, MN, University of Hartford, 315 Hudson St., Hartford, Conn. Bids May 5. AAarded May 28. CD 5-19, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ N. Y., Rochester—UNDERGROUND PARKING GARAGE—BA 6-22—Purchasing Agent, Rm. 16, City Hall, No. Alf. Austin Fitzhugh St., Zone 14, general contract, electrical work, heating, ventilating, plumbing, Main St. underground garage, Plans (incl. $50 Victor Gruen & Assocs., 2 West 14th St., New York, Zone 11, archts.) CD 4-16.

▲† D. C., Wash.—MEDICAL SERVICE SCHOOL—BA 6-24—U. S. Eng., 1st and Douglas Sts. N.W., Army Medical Service Graduate, Walter Reed Army Medical Center, ENG-49-083-59-48-501. Plans deposit $50, Ronald Senseman, 2705 Georgia Ave., N. W., archt. CD 4-14.

▲ N. Y., Mineola—BA 6-23—County Executive Nassau County, Old County Court House, Contr. 1002-2-IPO-53, lateral sewers at Oceanside and vicinity, Town of Hempstead, Sewage Collection Dist. No. 2 (IPO), $2,853,755. Plans deposit $25.

HEAVY CONSTRUCTION—LB & CA

▲ Johnson Drake & Piper, Inc., 80 Trinity Place, New York 6, N. Y., CA $5,511,693, Section 9 of approach roadway sys. in New York City for lower level expansion of George Washington Bridge, Contr. GWB-190.014, NEW YORK and NEW JERSEY Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids May 26. CD 5-28, under LB.

▲† Samuel N. Zarpas, Inc., Campbell's Run Rd., Box 4467, Pittsburgh, Pa., and Fullerton Constr. Co., 19156 Filer Ave., Detroit, Mich., joint venture, LB $2,655,000 (3 bidders), special facilities, Niagara Falls Air Force Base, ENG-49-076-59-190, NIAGARA FALLS, N. Y. (U. S. Eng., 111 E. 16th St., New York 3, N. Y. Bids May 27. CD 5-14.

▲ NEW JERSEY—State Hy. Dept., 1035 Parkway Ave., Trenton. Bids opened 5-27.
The Conduit & Foundation Corp., 158 N. 20 St., Phila., Pa., LB $2,128,784 (9 bidders), I-80 Interstate Rte. 80 bridges between Landing Rd. and US 46, Roxbury Twp. and Netcong, Morris Co. CD 5-8.

BUILDINGS—LB & CA

▲ Junard Development Corp., of New Jersey, 22 Maple Ave., Morristown, N. J. (Owner-Builds), $2,000,000, 75 HOUSES, North Star Dr., Mine's Twp., MORRISTOWN, N. J. W. H. Lishear, Woodland Rd., Madison, N. J., archt.

▲ Diller Plank Inc., Box 205, Willow St., Lancaster, Pa., CA, $2,169,635, general contract, MUNICIPAL BLDG., CLEONA, N. PA. (Lebanon County), court house, Lebanon, Pa. Bids Apr. 14. CD 4-20, under LB.

▲† Dean Constr. Co., 630 3rd Ave., New York, N. Y., LB $1,465,000 (8 bidders), OPERATING FACILITIES, incident elevator, and dumbwaiter, at National Institutes of Health, BETHESDA, MD., General Service Admin., 19th and F Sts. N. W., Wash. 25, D. C. Bids May 26. CD 5-22.

▲ Lawrence Constr. Co., 600 Woodbourne Ave., Baltimore 12, Md., CA $1,786,246, 2 story, stone, concrete, steel, SCHOOL, Providence Rd. and Baltimore Co. Beltway, near TOWSON, MD., Notre Dame Preparatory School, 4701 N. Charles St., Baltimore, Md. Bids May 7. CD 5-12, under LB.

▲ Piracci Constr. Co., 2552 Woodbrook Ave., Baltimore 17, Md., LB $766,000 (6 bidders), 1 story, steel, brick, block, concrete, Drems ELEMENTARY SCHOOL, Aero Acres near Middle River, LB $1,489,000, combination of both Middleborough ELEMENTARY SCHOOL and Drems ELEMENTARY SCHOOL, TOWSON, MD., Baltimore Co. Bd. Educ., Aigburgh Rd., Towson 4, Md. Bids May 28. CD 5-15.
Morrow Bros., Inc., 2313 N. Charles St., Baltimore 18, Md., LB $718,500 (6 bidders), 1 story, brick, concrete, steel, block, Middleborough ELEMENTARY SCHOOL, Back River Neck Section (Towson, Md.)

SOUTH

HEAVY CONSTRUCTION—BA

▲ Ga., Brunswick—TERMINAL—BA 6-26—Georgia Ports Auth., State Docks, Box 1049, Savannah, general cargo terminal, transit shed, wharf, etc., $2,000,000. Plans deposit $100. Fay, Spofford & Thorndike, 11 Beacon St., Boston, Mass., engrs. CD 10-7.

▲† Tennessee—GENERATORS—BA 6-16—Tennessee Valley Auth., New Sprankles Bldg., Knoxville, eight to sixteen 275,000 to 500,000 kw. steam-electric power generators. Extended date. CD 4-22.

▲ Fla., Tampa—POLICE STATION—BA 6-23—City, Pl. Wks., City Hall, police station, Estelle and Tampa Sts., $1,500,000, Dominick & Patterson, 608 Tampa St., archts. CD 5-27.

HEAVY CONSTRUCTION—LB & CA

▲ NORTH CAROLINA—State Hy. Comm., Raleigh. Bids opened 5-26.
N. C. Brown Paving Co., P. O. Box 484, Lexington, N. C., LB $210,946, est. $175,000-$200,000; CABC, BST on S. A. surf. 4.774 mi. on 2 county roads, vicinity of Buckland and White Oak, Proj. 8.21403 S-1143 (1), S-1174 (1), Gates Co., LB $104,744, est. $75,000-$100,000, subgrade reforming CABC, BST on S. A. surf. 3.2 mi. 2 sections of county road, vicinity of Belvidere and Bethel, Proj. 8.21706 S-476 (4), S-1144 (1), Perquimans.
N. C.—W. L. Coston & Sons, National Bank Bldg., Birmingham, Ala., LB $1,039,727, est. over $500,000, CABC and 9 in. concrete pavement and rest station 4.5 mi. Interstate 85 from Charlotte By-Pass to NC 273, West of Catawba River, Proj. 8.16527 I-85-3(2), Mecklenburg and Gaston Counties.

BUILDINGS—LB & CA

▲ Rust Engineering Co., 930 Fort Duquesne Blvd., Pittsburgh 22, Pa., CA $27,000,000, design and construct PAPER PLANT, NIDC, ROME, GA., Forest Kraft Co., Inland-Container Corp., 700 W. Morris, Indianapolis, Ind., and Mead Corp., 118 W. 1 St., Dayton, O.), Rome, Ga.

▲ V. L. Nicholson Co., 611 S. Central St., Knoxville, Tenn., CA $1,648,510, WOMEN'S RESIDENCE HALL, Phase 1, KNOXVILLE, TENN., University of Tennessee, Knoxville, Tenn. Bids May 20. CD 4-27.

▲ McDonough Constr. Co. of Georgia, 1958 Monroe Dr. N.E., Atlanta, Ga., LB $2,956,032, 320 low rent HOUSING UNITS, MEMPHIS, TENN., Memphis Housing Auth., 700 Adams St., Memphis, Tenn. CD 10-1, under LB.

MIDDLE WEST

BUILDINGS—BA

▲ O., Sylvania—SCHOOL—BA 6-30—Bd. Educ., high school, $1,876,000. Plans deposit $50. McLaughlin & Kelly, 500 Dominion Bldg., Lima, archts. CD 11-12.

BUILDINGS—SLC

▲ Ill., Chicago—SCHOOL—University of Chicago, 5801 Ellis Ave., soon lets contract, University of Chicago High School, $2,300,000. Perkins & Will, 104 W. Jackson Blvd., Zone 6, archts. CD 1-15.

HEAVY CONSTRUCTION—LB & CA

▲† Abbot Constr. Co., 5289 Lincoln Ave., Chicago, Ill., LB $1,426,333, hangar, National Guard Air Field, O'Hare Field, Park Ridge, CHICAGO, ILL., U. S. Eng., Merchandise Mart, Chicago 54, Ill. Bids May 21. (Correction—low bidder). CD 5-27, under LB, Ill., Park Ridge.

▲ MICHIGAN—State Hy. Dpt., Mason Bldg., Lansing, Denton Constr. Co., 20415 Macke Ave., Grosse Pointe Woods 36, Mich., CA $2,095,280, relocated M-78 Project to incl. 6.3 mi. divided roadways from M-13 northeast to Elms Rd., Genesee Co. Bids Mar. 4. CD 3-11, under LB.

BUILDINGS—LB & CA

▲ Rock Creek Bldg. Co., Sprucetree Lane, Amherst, O., Owner Builds, $2,100,000, 120 HOMES, Rock Creek Run Development, AMHERST, O.

▲ Turner Constr. Co., Gwynne Bldg., Cincinnati, O., CA Est. $4,000,000, 400,000 sq. ft. SUPPLY DEPOT, COLUMBUS, O., Westinghouse Electric Corp., Gateway Center, 401 Liberty Ave., Pittsburgh 30, Pa., A. M. Kinney, Inc., 2905 Vernon Pl., Cincinnati, O., archts. CD 4-16.

▲ Stanley Bach, 2201 Cedarview Rd., Cleveland 21, O., Owner Builds, $3,000,000, 206 HOMES, Lake St. north of Lake Shore Blvd., MENTOR, O.

▲ Gross Builders, 4787 Heitzel Rd., Parma, O., Owner Builds, $2,460,000, 120 HOMES, PARMA, O.

▲ Cleveland Housing Guild, 2487 Noble Rd., Cleveland 21, O., CA Est. $4,000,000, SHAKER HOUSE MOTOR MOTEL expansion, SHAKER HEIGHTS, O., Shaker House Motor Hotels, Inc., 2487 Nobel Rd., Cleveland 21, O. Bids Apr. 30. CD 4-21.

▲ A. C. Wermuth, Inc., 1046 St. Marys, Fort Wayne, Ind., CA Total est. $4,000,000, general contract, 2 story, 325 x 600 ft., steel, concrete, PRINTING PLANT, corner US 24 and Ind. 9 and 37, HUNTINGTON, IND., Our Sunday Visitor, Inc., Huntington, Ind. Bids Mar. 30. CD 3-24.

▲ John Wile Constr. Co., 826 Humler St., Louisville, Ky., LB $1,395,400, (10 bidders), HIGH SCHOOL, NEW ALBANY, IND., New Albany and Floyd Co. Cons. School Corp., New Albany, Ind. Bids May 25. CD 5-1.

▲ Johnson, Drake & Piper, Inc., 112 N. 7 St., Room 1, Terre Haute, Ind., CA $1,201,838, 43,777 sq. ft. rein.-con. RESIDENCE HALL for men, Student Center, DECATUR, ILL., Millikin University, Decatur, Ill. Bids Apr. 23. CD 3-31.

▲ Mercury Builders, Inc., 761 S. Harlem Ave., Forest Park, Ill., CA $1,664,000, David Gottlieb Memorial HOSPITAL, MELROSE PARK, ILL., West Towns Hospital Assn., 6733 W. North Ave., Oak Park, Ill. Bids May 5. Awarded May 22. CD 5-13, under LB.

▲† J. A. Fredman, Inc., 735 South Paddock St., Pontiac, Mich., CA $2,042,647, alterations, adds. to BUILDINGS 1 and 22 for Veterans Administration Hospital, DEARBORN, MICH., Veterans Admin., Munitions Bldg., Wash., D. C. Bids Apr. 28. CD 5-6, under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† Kan., Topeka—MISSILE COMPLEXES—BA On Or About 6-26—U. S. Eng., 1800 Federal Office Bldg., Kansas City, Mo., Missile Complexes, D, E, F, G, H, & I, near Forbes Air Force Base, ENG-23-028-59-72. CD 10-24.

▲† Tex., Austin—NIKE-HERCULES FACILITIES—BA About 6-23—U. S. Eng., Box 1229, Galveston, Nike-Hercules Facilities, Bergstrom Air Force Base, ENG-41-243-80, $1,000,000-$2,250,000. CD 9-11.

BUILDINGS—BA

▲† Tex., Victoria—POST OFFICE, etc.—BA 6-25—Public Buildings Service, General Services Admin., Business Service Center, 1114 Commerce St., Dallas Zone 2, United States Post Office and Courthouse, Appr. No. 47 x 1147, Proj. 41906. Plans deposit $100. CD 5/14/58, under Commercial Buildings.

(Continued on page 70)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000, other public works $88,000, industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England — Middle West
Middle Atlantic — West of Mississippi
South — Far West

PROPOSED WORK
Water Supply — Public Buildings
Sewers, Waste Disposal — Mass Housing
Bridges — Commercial Buildings
Streets & Roads — Industrial Buildings
Earthwork, Waterways — Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

Here's why 22-B Transit Cranes

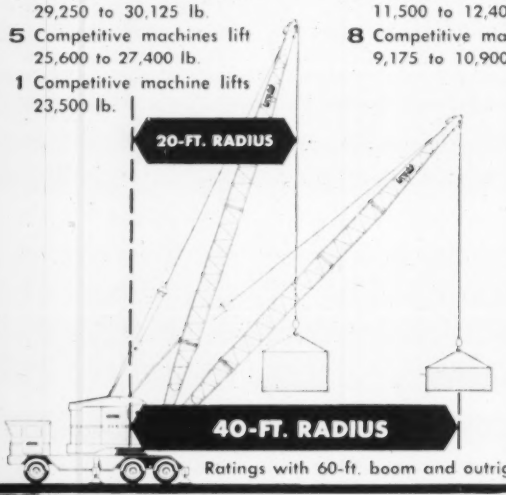
At 20 to 40-ft. radii, where you do the most work with a truck crane, the 22-B handles *bigger* payloads! Look at this comparison:

AT 20 FEET, 22-B LIFTS 33,000 LB.

- **4** Competitive machines lift 29,250 to 30,125 lb.
- **5** Competitive machines lift 25,600 to 27,400 lb.
- **1** Competitive machine lifts 23,500 lb.

AT 40 FEET, 22-B LIFTS 13,000 LB.

- **2** Competitive machines lift 11,500 to 12,400 lb.
- **8** Competitive machines lift 9,175 to 10,900 lb.



Ratings with 60-ft. boom and outriggers set.

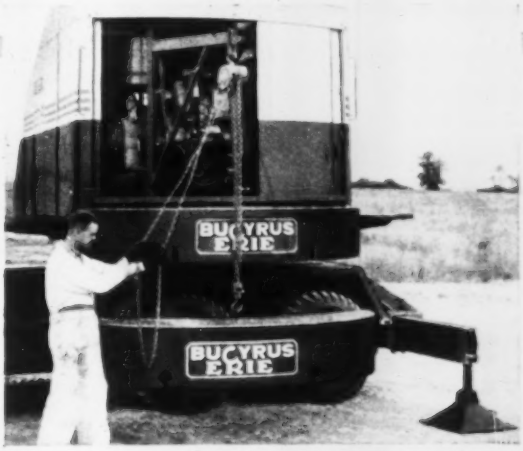
This is where MOST WORK IS DONE!

☆ **There's unusual stability** in the 22-B's wider spread outriggers. On the job, owners pull beams out to full 15-ft. spread, block them up — they're ready to work.

See your **BUCYRUS ERIE** Distributor . .

are YOUR BEST BUY!

Compare the capacities, compare the features!



WITH THE 22-B YOU GET

Unmatched load control!

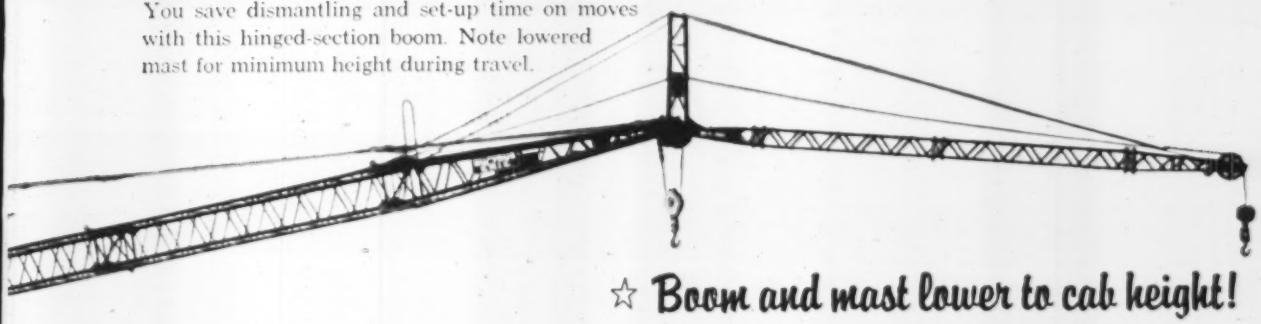
- Power-Controlled Lowering Boom Hoist
- Power-Controlled Load Lowering (hoist line)
- Friction Swing Brake
- Conical Hook Rollers

☆ Strips fast for travel!

Counterweight drops fast! Lowering time is cut to minutes by this special jib crane. System is manually operated, lets you drop counterweight to ground or low-boy trailer.

☆ Folding booms cut move time!

You save dismantling and set-up time on moves with this hinged-section boom. Note lowered mast for minimum height during travel.



☆ Boom and mast lower to cab height!

Booms up to 75 feet with or without mast can be lowered to cab height for traveling, *without* dismantling. 22-B picks up to 130 feet of boom and jib from ground without outside assistance!

☆ High alloy steel booms

are 50% stronger than ordinary structural steel booms, yet lighter in weight. Owners lift more PAYload . . . less DEADload!

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He will show you a 22-B in action!

• • •

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A BOON TO TRUCK CRANE OWNERS

INCREASE YOUR MOVING CAPACITY in both Short and Long Stick operations UP to 50% • FITS ALL MAKES & MODELS OF TRUCK CRANES

ROLLING OUTRIGGERS TRADE MARK PATENT PENDING

- ALLOW NEAR-CAPACITY LOADS TO BE MOVED OVER LEVEL AND RUGGED TERRAIN
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- TANDEM, PIVOTAL ACTION WHEEL ASSEMBLY
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GET THIS!
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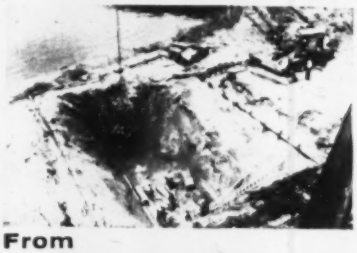

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GRIFFIN WELLPOINT CORP.
SALES • RENTAL • CONTRACT
881 E. 141st St., New York 54, N.Y.
Jacksonville, Fla. • Houston, Tex.
W. Palm Bch., Fla. • Hammond, Ind.

(Continued from page 67)

▲† Vitro Corp. of America, The Refinery Engineering Co. Division, 405½ Broadway, Farmington, N. M. CA $2,425,247, Upper and Lower Molina powerplants, penstocks, and equalizing reservoir, Colibran project, DC-5161, COLORADO. Bureau Reclamation, Dpt. Interior, Grand Junction, Colo. Bids Apr. 14. CD 4/16. †under LB.

BUILDINGS—LB & CA

▲ Harmon Constr. Co., 28 South Indiana, Oklahoma City, Okla. LB $1,670,000 (7 bidders). 9 story BARTON INSTITUTE for medical research, University of Arkansas Medical Center, LITTLE ROCK, ARK. University of Arkansas, Little Rock, Ark. Bids May 21. CD 4-24.

▲† Sunset Contractors, Inc., 8814 Sunset Blvd., Los Angeles, Calif. LB $3,527,000, 220 unit Capehart HOUSING, Ellsworth Air Force Base, No. 1, RAPID CITY, S. D. Base Procurement Office, Ellsworth Air Force Base, Rapid City, S. D. Bids May 26. CD 5-19.

▲ Manhattan Constr. Co. of Texas, 1811 Crawford St., Houston, Tex. CA Est. $1,500,000, BANK-OFFICE expansion, HOUSTON, TEX. National Bank of Commerce, 712 Main St., Houston, Tex. Bids May 12. CD 4/3.

▲ Harvey Stenmark & Co., 285 South Williams, Denver, Colo. LB $1,737,000, Alameda SENIOR HIGH SCHOOL, S. Wadsworth, between Arizona and Arkansas Aves., Alameda. LAKEWOOD, COLO. School Dist. R-1, 1580 Yarrow, Lakewood, Colo. Bids May 26. CD 5/4.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† Calif., Lompoc—BOMARC FACILITY—BA 6/25—U. S. Eng., 751 S. Figueroa St., Los Angeles. BOMARC 1M-99B G facility, incl. excavation, site grading, launcher shelter, ordnance storage bldg., assembly and maintenance bldg., roads and utilities. Vandenberg Air Force Base. ENG-04-353-59-104. $3,000,000.

BUILDINGS—BA

▲ Calif., San Jose—OFFICE—BA 7/24. Bd. Supervs. Santa Clara Co., 1st and Rosa Sts., 7 story, bsmt., 135,000 sq. ft. county office. $3,200,000. Plans deposit $100. Don Sage, Associated Architect, 352 Race St., San Jose, archts. CD 3-26.

HEAVY CONSTRUCTION—LB & CA

▲ Pacific Bridge Corp., North Harbor, Alameda, Calif. LB $2,462,645 (9 bidders). Jaybird Powerhouse, Jaybird Penstock and appurtenant works, Upper American River Proj., El Dorado Co., Inc. 2208. SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., Eng. Dpt., 1708 59th St., Sacramento, Calif. Bids May 28. CD 5/6.

▲ Frederickson & Watson Constr. Co., 873 81st Ave., Oakland, Calif. LB $1,321,111 (8 bidders), pavement for runway extens., San Francisco International Airport, Contr. 239, SAN FRANCISCO, CALIF. Public Utilities Comn., City Hall, San Francisco, Calif. CD 11-9-56.

BUILDINGS—LB & CA

▲ Everett Constr. Co., Scottsdale, Ariz., CA $2,000,000, 150 unit MOTOR HOTEL, SCOTTSDALE, ARIZ. Dailey Constr. Corp., Inc., 8510 Central Ave., N.E., Minneapolis, Minn. R. O. Nelson, Scottsdale, Ariz., archt.

▲ Robert E. McKee Contractors, 1918 Texas St., El Paso, Tex. CA $2,258,300, HOSPITAL, Wilmot Rd., near E. S. St., TUCSON, ARIZ. St. Mary's East Hospital, W. St. Mary's Rd., Tucson, Ariz., Scholer & Fuller, 2566 N. Campbell Ave., Tucson, Ariz., archts. Bids May 7.

▲ Williams & Burrows, Inc., 500 Harbor, Belmont, Calif. LB $4,695,000, Base Bid 1, LB $4,435,000, Base Bid 2, 5 story, bsmt., 240,000 sq. ft. EDUCATION-PSYCHOLOGY BLDG., BERKELEY, CALIF. Bd. Regents, University of California, Admin. Bldg., Berkeley, Calif. Bids May 26. CD 5/1.

▲ Pozzo Constr. Co., 970 N. Virgil St., Los Angeles, Calif., CA $1,250,000, 4 story, 48,448 sq. ft. concrete OFFICE, 9400 Brighton Way, BEVERLY HILLS, CALIF. J. V. Cameo, 9714 Santa Monica Blvd., Los Angeles, Calif. Kenneth T. Thompson, 9278 Santa Monica Blvd., Beverly Hills, Calif., archt.

▲† Phillip Yousem Constr. Co., 1500 Lincoln Blvd., Venice, Calif., CA $12,200,000, 800 unit Capehart HOUSING, Naval Air Station, NBy 18274, LEMOORE, CALIF. Dist. P. Wks. Office, 12th Naval Dist., Room C112, San Bruno, Calif. Bids Apr. 30. CD 5-5. †under LB.

▲ Rossmoor Builders, 3402 Rossmoor Way, Los Alamitos, Calif., Owner Builds, $5,832,560, 359 frame, stucco DWELLINGS, Lots 1-360, Tract 2572, LOS ALAMITOS, CALIF.

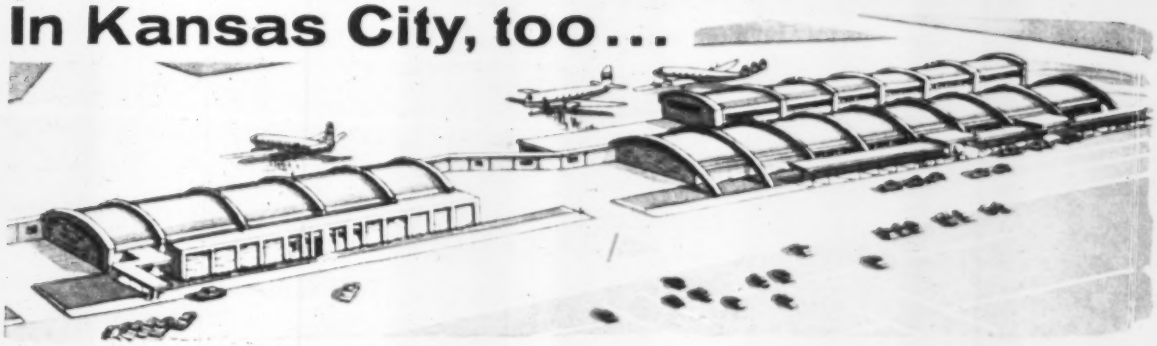
▲ Buckeye Constr. Co., 292 La Cienega Blvd., Los Angeles, Calif., Owner Builds, $1,250,000, 6 story, 140,000 sq. ft., brick, steel OFFICE, 8510 Wilshire Blvd., LOS ANGELES, CALIF.

▲ B. L. Metcalf Co., 1460 N. Glassell Ave., Orange, Calif., CA $1,700,000, 120,000 sq. ft. steel frame superstructure for SPACE TECHNOLOGY LAB., NEWPORT BEACH, CALIF. Aerojet-General Sys., Inc., 1234 Airway, Glendale, Calif. Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., Los Angeles, Calif., archts. Bids May 19, awarded May 22—CD 10-19-57.

▲ Louis G. Dunn, 1100 Wilshire Blvd., Los Angeles, Calif., CA $1,989,250, est. $1,900,000, 4 story reinforced concrete HOSPITAL, SAN PEDRO, CALIF. San

(Continued on page 73)

In Kansas City, too...



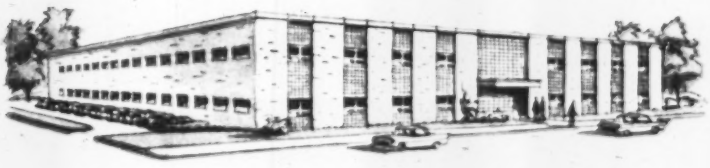
AIR TERMINAL BUILDING, Kansas City, Mo.
Office and ticket area, ⅝" Zonolite plaster and ½" Zonolite Acoustical Plastic on metal lath. Terminal area, Zonolite Acoustical Plastic applied direct to thin shell concrete.

ARCHITECT: Cooper, Robinson, Carlson, O'Brien.
GENERAL CONTRACTOR: Interstate Constr. Co.
PLASTERING CONTRACTOR: Schowengerdt Plastering Co.

ZONOLITE®

Low-cost FIREPROOFING

rates high in newest buildings



CAA BUILDING, Kansas City. ⅝" Zonolite plaster and ½" Zonolite Acoustical Plastic machine-applied on metal lath.
ARCHITECT: Fullerton & McCamis.
GENERAL CONTRACTOR: Sam Dasta & Sons Constr. Co.
PLASTERING CONTRACTOR: E. J. Walters Plastering Co.

BLUE RIDGE SHOPPING CENTER, Kansas City. ¾" Zonolite plaster on suspended metal lath for 2-hour fire rating.
ARCHITECT: J. F. Lauck & Assoc.
GENERAL CONTRACTOR: Fox-Swenson Constr. Co.
PLASTERING CONTRACTOR: Schowengerdt Plastering Co.

3- and 4-hour fire ratings... cuts days off building time... saves 7" of height per story... adds built-in acoustical benefits.

Yes, in Kansas City and the nation over, these special benefits are winning new friends for *Zonolite Fireproofing* at an unprecedented rate. And for good reasons, too.

Machine-applied direct to steel, it achieves all these "extras" plus a substantial reduction in dead weight and in construction costs.

As a back-up for "curtain" walls, Zonolite portland-cement plaster provides insulation, fire protection, light weight, wind resistance.

As a plaster fireproofing, it provides incombustibility plus speedy application with modern plaster machines.

It's the answer to any problem where construction demands light weight and maximum fire safety at lowest cost. Get the facts now.

NORTH KANSAS CITY BOWL, Kansas City. Zonolite concrete over galvanized metal roof deck; also Zonolite Acoustical Plastic, machine-applied on suspended metal lath ceiling.
ARCHITECT: Albert C. Martin & Assoc., Los Angeles.
GENERAL CONTRACTOR: Estrin Constr. Co.
PLASTERING CONTRACTOR: Schowengerdt Plastering Co.
ROOF APPLICATOR: Roheer Roof Decks, Inc.

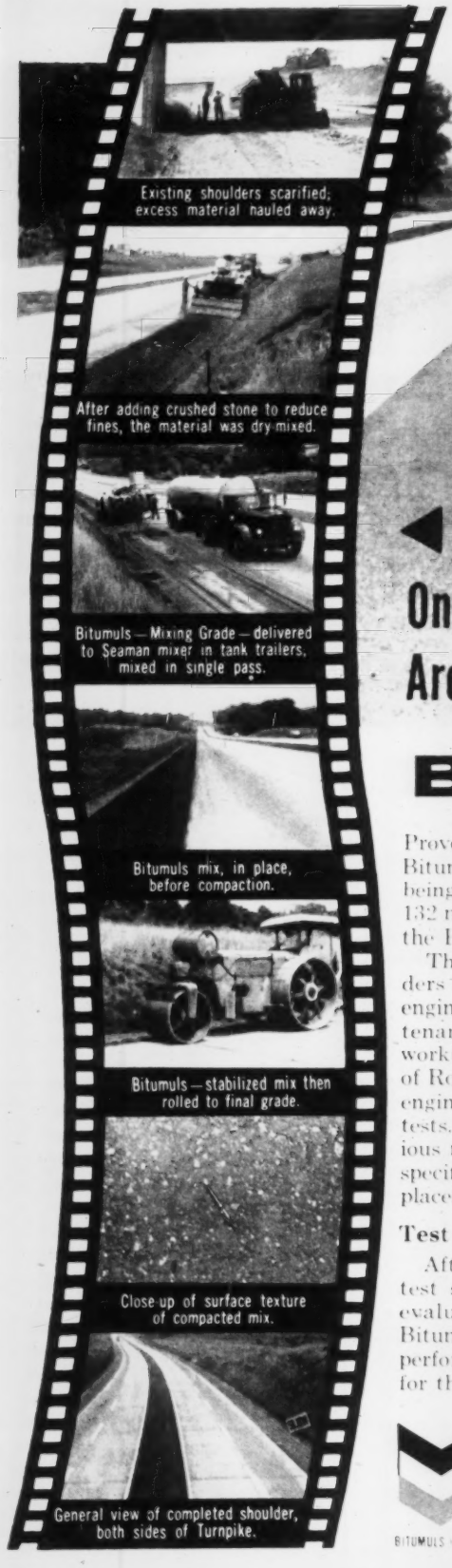
MAIL THIS COUPON for complete information on Zonolite fireproofing

ZONOLITE COMPANY

135 S. La Salle St., Chicago 3, Ill.

ZONOLITE COMPANY, Dept. ENR-69, 135 S. La Salle St., Chicago 3, Ill.
Send me booklet PA-41, "Plaster and Acoustical Systems," and Data Sheet: PA-35, "Direct-to-Steel Fireproofing."

Name _____
Firm _____
Address _____
City & Zone _____ State _____


Existing shoulders scarified; excess material hauled away.
After adding crushed stone to reduce fines, the material was dry-mixed.
Bitumuls—Mixing Grade—delivered to Seaman mixer in tank trailers, mixed in single pass.
Bitumuls mix, in place, before compaction.
Bitumuls—stabilized mix then rolled to final grade.
Close-up of surface texture of compacted mix.
General view of completed shoulder, both sides of Turnpike.

◀ Here's How Shoulders On Pennsylvania Turnpike Are Being Stabilized With

BITUMULS

Proved best by comparative test, Bitumuls emulsified asphalt is now being used to stabilize most of the 132 miles of 8-foot shoulder along the Pennsylvania Turnpike.

The original untreated shoulders were inadequate. In 1955, engineers of the Turnpike Maintenance Materials Department, working with Michael Baker, Inc., of Rochester, Penna., (consulting engineers) took samples and ran tests. Based on their findings, various methods and materials were specified for test-sections of replacement shoulders in 1956.

Test Results:

After a winter of service, the test sections were checked and evaluated early in 1957. The Bitumuls stabilized section had performed best, and was specified for the job.

Bitumuls shoulder stabilization is fast and economical (see left). The untreated shoulders are scarified; some material is removed. Crushed stone is added to reduce the fines content, and the material is dry-mixed in place.

Bitumuls delivered by tank-trailer, is pumped, cold, through the mixer. In a single pass the material is mixed and laid, ready for rolling.

Work on the Turnpike shoulders started in 1957 from Mile Post 230 (Gettysburg Interchange) and will be completed in 1959 at Mile Post 296 (Morgantown Interchange).

The size and importance of this Turnpike job sharply underscores one point: Bitumuls provides adequate stability for long-lasting, heavy duty shoulders at low cost!

Call our nearest office for additional information.

American Bitumuls & Asphalt Company

320 MARKET, SAN FRANCISCO 20, CALIF.

Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio
Atlanta 8, Ga.
Mobile, Ala.
St. Louis 17, Mo.
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Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

BITUMULS ® Emulsified Asphalts • CHEVRON ® Paving Asphalts • LAYKOLD ® Asphalt Specialties • PETROLASTIC ® Industrial Asphalts

(Continued from page 70)

Pedro Community Hospital, 1405 W. 6th St., San Pedro, Calif. Bids Apr. 23, awarded May 22. CD 4-29 under LB.

CANADA

HEAVY CONSTRUCTION—BA

▲ Ont., Toronto—TUNNEL LININGS—BA 6-22—Toronto Transit Comm., 1900 Yonge St., requires about 22,000 tons C.I. stone, design for University Ave. Subway. Plans deposit $25. W. S. Atkins & Assocs., Ltd., 33 Price St., engrs. CD 5-18.

BUILDINGS—LB & CA

▲ G. A. Baert Constr. Co. Ltd., 314 Dawson St., Winnipeg, Man. $3,974,000. (7 bidders) OFFICE, York Ave., WINNIPEG, MAN.: Manitoba Dist. P. Wks., Legislative Bldg., Winnipeg, Man. Bids Apr. 15, awarded May 22. CD 4-15 under LB.

▲ Landscape Court Apartments Ltd., 440 W. Hunt Ave., Toronto, Ont., contract for Owner-Builder, $1,372,248. nine 5-to-6-story apartment buildings with underground parking for 240 cars. APARTMENTS: Sheppard Ave. W., TORONTO, ONT. Wilfred Shulman, 1375 Bay St., Toronto, Ont., archt.

PROPOSED PROJECTS

WATER SUPPLY

▲ Ind., Lafayette—City, City Hall—WW expansion program, $2,300,000. Work may start in June.

▲ N. Y., New York—Bd. Water Supply, 120 Wall St., New York—11,000 ft. water tunnel under lower New York Bay from Brooklyn to Staten Island, $25,000,000 (no appropriation).

▲ N. Y., Troy—City, City Hall—transmission main, filtration plant, booster pumping stations, storage reservoir, $7,950,000. Camp, Dresser & McKee, 6 Beacon, Boston, Mass., engrs. CD 5-22.

SEWERS, WASTE DISPOSAL

▲ Fla., Miami—Dade Co., County Bldg., sewerage facilities, northeast Dade Co., $3,550,000.

▲ Wash., East Wenatchee—East Wenatchee Sewer Dist. No. 1, sanitary sewerage sys.; Proj. No. Wash. 46-P-1058, $1,770,000.

BRIDGES

▲ WASHINGTON—State Hy. Comm., Olympia—Pierce Co., viaduct to carry A St. over railroad tracks from S. 34 to 21 Sts., $3,500,000. W. A. Bugge, state hy. dir.

STREETS AND ROADS

▲ ALABAMA—State Hy. Dist., Montgomery—Jefferson Co., 5.4 mi. U.S. 280 from Water Works to Birmingham, 12 mi. U.S. 78 from Adamsville to Graysville, $4,000,000.

▲ OREGON—State Hy. Dist., Salem—Coos and Douglas Counties, hwy., State Hy. 82 between Coquille and Roseburg, $4,000,000.

EARTHWORK, WATERWAYS

▲† Texas—Agua Pequita Soil Conservation Dist., Hebbronville—San Diego-Agua Dulce Soil Conservation Dist., Duval, Jim Wells County Conservation Dist., Corpus Christi—Jim Wells County, Agua and Nueces County, Corpus Christi—Douglas Creek watershed protection, San Diego-Rincon Creeks, 222,450 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Douglas Creek, 4 mi. channel improvement, 2 mi. levees, Agua Dulce Creek, 215,700 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Rincon Creek, 4 mi. channel improvement, 2 mi. levees, Agua Dulce Creek, 228,725 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Nueces and Jim Wells Counties, for Soil Conservation Service, $2,841,732.

▲† Texas—San Diego-Agua Dulce Soil Conservation Dist., Agua Dulce—Agua Dulce, Soil Conservation Dist., Duval, Jim Wells County Conservation Dist., Corpus Christi—Jim Wells County, Agua and Nueces County, Corpus Christi—Douglas Creek watershed protection, San Diego-Rincon Creeks, 222,450 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Douglas Creek, 4 mi. channel improvement, 2 mi. levees, Agua Dulce Creek, 215,700 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Rincon Creek, 4 mi. channel improvement, 2 mi. levees, Agua Dulce Creek, 228,725 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Nueces and Jim Wells Counties, for Soil Conservation Service, $2,871,640.

▲† Texas—San Diego-Agua Dulce Soil Conservation Dist., Agua Dulce—Agua Dulce, Soil Conservation Dist., Duval, Jim Wells County Conservation Dist., Corpus Christi—Jim Wells County, Agua and Nueces County, Corpus Christi—Douglas Creek watershed protection, San Diego-Rincon Creeks, 222,450 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Douglas Creek, 4 mi. channel improvement, 2 mi. levees, Agua Dulce Creek, 215,700 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Rincon Creek, 4 mi. channel improvement, 2 mi. levees, Agua Dulce Creek, 228,725 cu. yds. diversion, 2 mi. channel improvement, 2 mi. levees, Nueces and Jim Wells Counties, for Soil Conservation Service, $1,282,762.

LATIN AMERICA

▲ Mexico, Reynosa—PLANT—Petroleos Mexicanos (Pemex), Dist. P. Wks., Main Admin. Bldg., Mexico City, enlarging refinery plant, $2,000,000. Dist. P. Wks., Main Admin. Bldg., Mexico City, staff engr. CD 3-24-59.

AMERICANS ABROAD

▲ Netherlands, Rotterdam—TERMINAL—Continental Brothers Petroleum Corp., Wassenaar, Rd., Hoofddorp, N. Y., & affiliates, 2 docks, 2 tanks, 60,000 barrel product storage and tanker terminal.

PUBLIC BUILDINGS

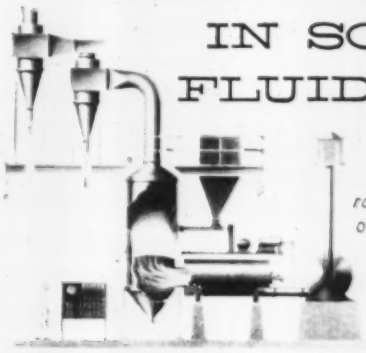
▲ Ark., Little Rock—LIBRARY—City, City Hall, 3 fl., by Sasser & Allen, Gazette Bldg., Little Rock; Matthews Bldg., North Little Rock, 2 story, about 70,600 sq. ft., concrete brick, brick, $11,000,000. Rawlins E. Brayton & Assocs., Pyramid Life Bldg., Little Rock, consulting engrs. CD 11-22-57.

▲ Calif., Monterey—SCHOOL—Monterey Jt. Union High School Dist., 1010 Elm Ave., Seaside, by William D. Cline, 1010 Elm Ave., Seaside, for Fifth Junior High School, First Bid, $1,100,000. CD 11-13-56.

DORR-OLIVER POINTERS

A SERVICE TO THE PROCESSING INDUSTRIES

WHAT'S NEXT IN SOLIDS FLUIDIZATION?



A versatile drying, roasting and calcining technique offers opportunities in chemical processing. Here's a report on developments.

Since Dorr-Oliver first introduced the fluidization technique for non-catalytic applications more than ten years ago, our engineers have been constantly investigating its wide potentialities. From such well established operations as the roasting of sulphide ores, SO_2 production for acid manufacture, drying of fine coal and drying and sizing of lime stone, development is now extending into many fields of chemical processing.

The advantages of FluoSolids®, Dorr-Oliver's system for fluidized bed techniques, are its essential simplicity, its compactness, its low operating and maintenance costs, its ability to take wide feed variations and its inherent adaptability to precise temperature control with simple instrumentation. It has proved particularly effective in drying wet, sticky or otherwise difficult-to-handle materials. In some drying operations, the added benefit of classification by particle size is possible.

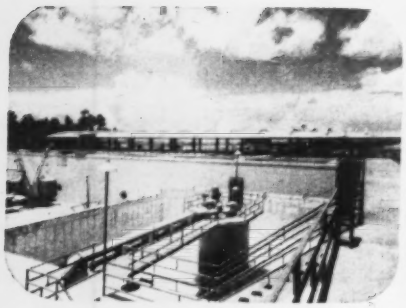
At D-O's research and development center, Westport, Connecticut, hundreds of test runs covering many possible new applications have been completed. Typical of these are the drying of heat sensitive polymers, hydrochloric acid and sodium sulphate production by the Hargreaves Process, drying of sodium chlorate crystals and potassium silicon fluorides, drying of chemical precipitates, roasting of furfural residues, and low temperature calcination of phosphates. Opportunities for still further development are far from exhausted.

To sum it up: if you want a continuous, high capacity method of drying or heat treating materials . . . if precise and completely uniform temperatures are needed to prevent, induce, or control chemical or physical action . . . if intimate contact of gases with solids is a necessary part of your processing . . . maybe the Dorrco FluoSolids System is your answer.

Chances are that our engineers have already been working on just such a problem as yours. If they haven't, the information and experience now available should at least provide a good starting point for investigation and evaluation. An inquiry costs nothing — and it may open up mutually rewarding opportunities. Dorr-Oliver Incorporated, Stamford, Connecticut.

Dorr-Oliver offers a wide range of equipment, methods and complete systems for the processing industries. Operations include:

ROASTING • DRYING • CALCINATION • CLASSIFICATION • THICKENING • SCREENING • FILTRATION • CLARIFICATION • WASHING • AGITATION • CENTRIFUGATION • ION EXCHANGE • PUMPING



How to keep water in!

All Concrete Masonry
NEEDS CONCRETE PROTECTION

Before THOROSEAL was applied, note porous concrete structure.

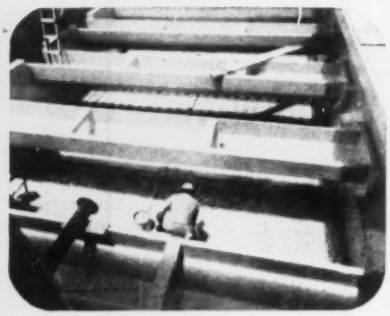
THOROSEAL PROTECTION!

Just like concrete, THOROSEAL is cement-based, and therefore perfectly compatible with the concrete masonry to which it is applied; actually becomes part of the structure!

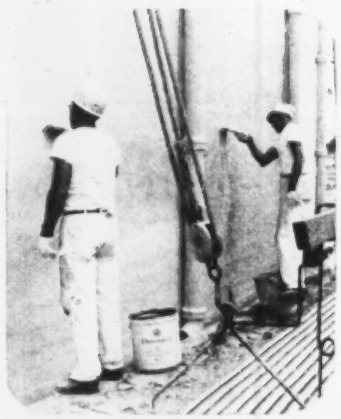
Here, the City of Miami's Department of Water and Sewers Maintenance Crew is applying THOROSEAL to all the masonry of their new 2,500,000 gallon Alexander Orr Filtration Plant. Although the poured concrete structures of these tanks are excellent examples of engineering, it was imperative that they would not deteriorate from constant water pressure.

The interior and exterior surfaces of the elaborate structure were given one brush coat of STANDARD GRAY THOROSEAL and one trowel coat of PEARL GRAY THOROSEAL. THOROSHEEN RW-7, acrylic masonry paint, was applied over the THOROSEAL, for extra beauty, in several areas.

The City of Miami's foresightedness in taking these precautionary steps will save them thousands of dollars in maintenance costs and water loss due to leakage.

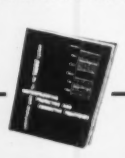


THOROSEAL has now completely filled and sealed the concrete against all weathering and loss of water.



THOROSEAL also protects the outside masonry of filtration plant against the elements and deterioration.

Contractor—PITT CONSTRUCTION COMPANY
Subcontractor—FRED HOWLAND CONSTRUCTION COMPANY



Standard Dry Wall Products, Inc.
NEW EAGLE, PA. BOX X

▲ Calif., Oakland—LIBRARY, etc.—City, City Hall, defeated $1,246,000 bonds May 19, main library and branches. CD 2/25.

▲ Calif., Oakland—MUSEUM—City, City Hall, defeated bonds May 19, museum, $5,950,000. Skidmore, Owings & Merrill, 1 Montgomery St., San Francisco, archts. CD 2/25.

▲ Calif., Palo Alto—SCHOOLS—Palo Alto Unified School Dist., 25 Churchill Ave., voted $2,500,000 bonds for 3 elementary schools and schools addn. CD 6/15/54.

▲ Calif., San Carlos—SCHOOLS—San Carlos School Dist., voted $1,606,000 bonds schools. CD 12/16/52.

▲ Calif., San Juan Capistrano—SCHOOL—Capistrano Union High School Dist., 31422 State Hy., $1,850,000 bond election June 23, high school. Bond date extended. CD 3/24.

▲ Colo., Lakewood—SCHOOL—School Dist. R-1, 1580 Yarrow, plans by Musick & Musick, 1524 York, Denver, Marie Creighton Junior High School, West 6 and Kipling, $1,000,000. CD 6/5/58.

▲ Conn., Danbury—SCHOOL—Town, Town Hall, Junior High School, $2,250,000.

▲ Conn., West Haven—SCHOOL—Town, Town Hall, plans by Polak & Sullivan, 1347 Chapel St., New Haven, 3 story, V-shaped high school, Kelsey Ave., $2,600,000. Arth. G. Beaulieu Assocs., 2348 Whitney Ave., Hamden, consult. engrs. CD 1/9.

▲ Fla., Tampa—POLICE STATION—City, Dpt. P. Wks., City Hall, plans by Dominicis & Patterson, 608 Tampa St., 2 story, 227 x 240 ft. police station, $1,300,000.

▲ Ill., Antioch—SCHOOL—Antioch Twp. High School Dist., defeated $1,785,000 bond issue at referendum May 9, high school at Loon Lake and Deep Lake Rds., $1,540,287. Gilbert A. Johnson, American National Bank Bldg., Rockford, archt. Plan to resubmit in August and or September. CD 4/27.

▲ Iowa, Charles City—SCHOOL—Community School Dist., Bd. Educ., voted $1,250,000 bonds Apr. 30, senior high and grade school. The Griffith Co., M-31 Warder Bldg., Fort Dodge, archt. CD 4/27.

▲ La., Covington—SCHOOLS—St. Tammany Parish School Bd., $2,915,000 bond election June 16, schools expansion and improvt. programs.

▲ Mich., Berkeley—SCHOOLS—Bd. Educ., voted $1,800,000 bonds, high school addn., two Junior High School addns. and elementary school and administration bldg. CD 11/19/57.

▲ Minn., Edina (P.O. Minneapolis)—SCHOOLS—Bd. Educ., voted $4,000,000 bonds, May 19, elementary school, $1,200,000; high school addn., $2,800,000. Lang & Raugland, 802 Wesley Temple Bldg., Minneapolis, archts. CD 4/18.

▲ Minn., Inver Grove—SCHOOL—Independent School Dist. No. 199, Inver Grove, voted $1,600,000 bonds, May 1, Junior High School. Pine Bend. Ellerbe & Co., 333 Sibley St., St. Paul, archts.

▲ Minn., Mounds View—SCHOOL—Bd. Educ., voted $1,800,000 bond, May 19, Junior High School. Ellerbe & Co., 333 Sibley St., St. Paul, archts. CD 4/30.

▲ N. Y., Brooklyn—SCHOOL—Bd. Educ., Bureau Constr., 110 Livingston St., Long Island City, Zone 1, P. S. 274, Kosciusko St. and Bushwick Ave., $2,337,500.

▲ N. Y., Freeport—SCHOOL—Bd. Educ., bond election June 4, elementary school, Ata Jore Site, Cedar St. and St. Marks Ave., $1,460,000. Details 1959-14wb.

▲ N. Y., New York—PARKING GARAGE—Dpt. P. Wks., Municipal Bldg., Zone 7, Proj. TP-4N, parking garage, Jerome Ave. and E. 149th St., Bronx, Bldg., $1,700,000. Praeger-Kavanagh-Waterbury, 126 E. 59th St., Zone 16, consult. engrs.

▲ N. Y., New York—PUBLIC HEALTH LABORATORY—Dpt. P. Wks., Municipal Bldg., Zone 7, plans by De Young, Moscowitz & Rosenberg, 205 E. 42nd St., Zone 17, Proj. HL-49, public health laboratory, East Ave. between E. 26th and E. 27 Sts., $10,000,000. To go ahead after 1959. CD 11/14/57.

▲ N. Y., North Tonawanda—SCHOOL—North Tonawanda School Dist., defeated bonds May 19, high school, $4,315,000. CD 4/21.

▲ O., Boardman—SCHOOL—Bd. Educ., Boardman School Dist., voted bonds May 19, Junior High School, [illegible] site, [illegible] Rd., $1,890,000. CD 2/18.

▲ O., Toledo—SCHOOLS—Bd. Educ., Adams Twp. School Dist., 1810 Kenwood Tr., bond election Nov. 3, schools, $2,800,000. McLaughlin & Kell, 600 Dodge Bldg., Lima, archts. CD 11/11.

▲ O., Youngstown—SANITARY HOME—Mahoning County Commrs., bond election Nov. 4, county home, $1,500,000.

▲ Pa., Burgettstown—SCHOOL—Burgettstown-Jefferson Joint School Dist., Burgettstown, Secondary School, $2,750,000.

▲ Pa., Gerstown—SCHOOLS—Richland Twp. School Dist., Gerstown, voted bonds, addns., $1,000,000. Elementary school, $756,000.

▲ Tex., Amarillo—SCHOOLS—Amarillo School Dist., [illegible] voted bonds May 9, high school, $1,975,000. [illegible] & Jones, [illegible] Rittenberry, 114 E. 6th St., Austin, Group 21, auditorium, $600,000. Austin B. Shiver, Fine, M&P Bldg., architects, [illegible] School, No. 1, $600,000. Elementary School, No. [illegible], $600,000. Elementary School, No. [illegible], $600,000. [illegible] & Jones, 1717 Mo. Ave., architects, for Elementary Schools 1, 2, and 3, CD 6/5/58.

▲ Tex., Dallas—SCHOOLS—Dallas County Junior College Dist., [illegible] bonds, Dallas [illegible], $5,000,000.

▲ Tex. Houston — FEDERAL ... $12,000,000-$17,000,000.

▲ Tex. Irving — HOSPITAL ... $2,000,000.

▲ Tex. San Antonio — ... $1,500,000.

▲ Wis. Kenosha — ... $2,000,000. $825,000. $710,000. $740,000. $825,000.

▲ Que. Verdun — Schools, etc. Verdun Catholic School Board ... high school and 2 residences for teachers. $3,000,000.

COMMERCIAL BUILDINGS

▲ Ariz. Phoenix — HOTEL—A. E. Siegal & Mary Siegal, ... Arizona Thunderbird Hotel, East Van Buren St. $4,000,000.

▲ Calif. Van Nuys — DWELLINGS—Longacre Realty Co., ... $1,209,000.

▲ Calif. Whittier — DEPARTMENT STORE—Broadway Department Store, ... $6,000,000.

▲ Colo. Grand Junction — SHOPPING CENTER—Dale Lake, Grand Junction, ... $1,000,000.

▲ Conn. New Haven — APARTMENTS—New Haven Community Housing, ... $1,500,000.

▲ Fla. Tampa — HOTEL—... $1,500,000.

▲ Ill. Chicago — ... $1,000,000.

▲ Ill. Chicago — APARTMENTS—Webb & Knapp, ... $7,000,000.

▲ Ky. Louisville — APARTMENT—... $4,000,000-$5,000,000.

▲ Md. Towson — MEDICAL CENTER—Towson Medical Center, ... $10,000,000.

▲ Mass. Boston — LAW CENTER—... $2,000,000.

▲ Mo. Kansas City — ... $1,000,000.

▲ N. Y. Brooklyn — APARTMENTS—... $5,000,000.

▲ N. Y. Dobbs Ferry — ... $1,288,000. $1,087,000. $6,500,000.

▲ N. Y. West Seneca (P. O. Buffalo) — APARTMENTS—... $2,275,000.

▲ O. Cincinnati — ... $1,300,000.

▲ O. Dayton — ... $1,470,000.

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FIREBALL

Other Miller welders in this series include:

DA-300-L BIG RIG
Four-in-One:
AC arc welder; DC arc welder; 10 KW AC power plant; 1 KW DC while welding

D-250-L ROUSTABOUT
Three-in-One:
DC arc welder; 10 KW AC power plant; 1 KW DC while welding

D-250-W ROUGHNECK
Two-in-One:
DC arc welder; 1 KW DC while welding

Here's what makes this Miller model the "Five-in-One"

1. AC welder for metallic arc welding
2. DC welder for metallic arc welding
3. AC or DC welder for TIG welding
4. A 10 KW, 115/230v single phase 60 cycle power plant
5. 1 KW of DC while welding

The DAH-350-L Fireball, driven by Hercules 32 hp engine, is another Miller FIRST, offers both a-c and d-c for metallic arc or TIG welding with three separate a-c and d-c amperage ranges for each.

There's continuous high frequency for a-c TIG welding with choice of "start only" or constant high frequency for d-c TIG work.

Standard equipment includes built-in high frequency stabilizer, polarity switch, power supply for water coolant system, and automatic inert gas control panel with solenoid valve and post flow timer. Trailers are available for welder only or for welder with coolant system and gas cylinders.

SPECIFICATIONS

	Metallic Arc	Tungsten Arc
WELDING RANGE	35-100 Amps AC	35- 75 Amps AC
	65-160 Amps AC	65-160 Amps AC
	110-400 Amps AC	150-375 Amps AC
	35- 80 Amps DC	35-100 Amps DC
	75-175 Amps DC	85-225 Amps DC
	125-350 Amps DC	170-375 Amps DC
RATED OUTPUT	250 Amps Tungsten Arc, 100% Duty Cycle DC	
	300 Amps Tungsten Arc, 100% Duty Cycle AC	
CURRENT ADJUSTMENT STEPS	Infinite	
MAXIMUM O.C.V.	72 Volts DC	
	80 Volts AC	
1 KW DC AUXILIARY POWER	115 Volts	
AC GENERATOR OUTPUT	10 KW	
OUTPUT VOLTAGE	115/230 Volt, 1 Phase, 60 Cycle	

Complete specifications on these welders will be sent promptly upon request.

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Monson & Sivers, engineers on this Western Foundry building, report "three basic shell systems were considered . . . Upon analyzing all three, the most economical was the glued laminated beam system. Cost of the basic laminated shell in its entirety, including the columns, roof and crane beams plus all the necessary bracing erected was slightly over $1 per square foot. In going to the laminated beam system, aesthetic qualities were not overlooked, as the clean lines of the beams and columns give somewhat of a classic appearance."

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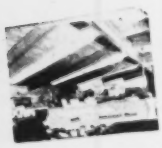

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▲ O., Springfield—DEPARTMENT STORE—James R. Williams Investment Co., 5th 3rd Bank Bldg., Cincinnati, department store, Southern Village Shopping Center, $1,000,000. Federal Dpt. Stores Inc., Highland Park, Mich., lessee.

▲ O., Youngstown—HOMES—Edw. J. DeBartolo, 2640 Market St., 900 homes, west side Rte. 46, College Park Estates, $11,000,000.

▲ Okla., Oklahoma City—MOTEL—Sylvanus Fehr, Fidelity Bank Bldg., plans by Hudgins, Thompson & Ball, 1411 Classen, super duper motel and cafe on East Expressway, $1,250,000. CD 9-12.

▲ S. C., Anderson—SHOPPING CENTER—Max Stewart, c/o H. Harold Tarleton Jr. & Assocs., archts., 1601 N. Pleasantburg Dr., Greenville, shopping center, $1,000,000.

▲ Tenn., Nashville—LEARNED HALL—Vanderbilt University, Nashville, 6 floor learned hall addn. adjacent to medical school, $1,400,000.

▲ Tex., Houston—HOTEL, etc.—Sharaton-Lincoln Hotel (Joint Venture by Lincoln Liberty Life Ins. Co., 1516 Milam St., Houston, Tex., and Sheraton Corp. of America, 475 Commonwealth Ave., Boston, Mass.), 21-20 story hotel, $15,000,000; auto parking-garage, $750,000. Milam, Louisiana Sts. and Park and Dallas Aves.

▲ Tex., Houston—OFFICE—Southern States Life Insurance Co., Main-Rice National Bank Bldg., $1,500,000-$3,500,000.

▲ Tex., Houston—OFFICE—Southwest Holdings, Inc., Hugh January Co., Gulf Bldg., office, city to be named; Beard and Stiele Eng. Co., Miami, between Dallas and Polk Sts., $4,000,000.

▲ Wash., Bremerton—RETIREMENT HOME—First Methodist Church, 502 Pacific Ave., retirement home, $1,000,000.

▲ Que., Montreal—OFFICE—The Toronto-Dominion Bank, 55 King St. W., Toronto, Ont., plans by Ross, Fair, Duschenes & Barrett, archts.-consult. engrs., 3115 Sherbrooke St.-W., 24 story steel frame office bldg., St. James and McGill sts., $3,000,000. CD 5-11.

INDUSTRIAL BUILDINGS

▲ Ark., Russellville—FACTORY—Ward Furniture Co., 1201 N. 1 St., Fort Smith, 24,000 sq. ft. furniture factory, Russellville Industrial Development, $1,200,000.

▲ Calif., Samoa—PULP, PAPER MILL—Georgia-Pacific Paper Co., Equitable Bldg., Portland, Ore., pulp and paper mill, $20,000,000.

▲ Ill., East Peoria—WAREHOUSE AND COFFEE ROASTER PLANT—Chris Hoerr & Son, 1321 SW Washington, Peoria, plans by Lawton-Ziegele-Terry & Assocs., 1100 Main St., Peoria, 140,000 sq. ft. warehouse and coffee roaster plant, Expressway and Rte. 150, $1,000,000.

▲ Ind., East Chicago—SINTERING PLANT—Inland Steel Co., 30 W. Monroe St., Chicago 3, Ill., sintering plant, incl. expansion in tin plate dpt., expanding capacity to roll wide flange beams, $85,000,000.

▲ N. J., Hightstown—LABORATORY—National Lead Co., 111 Broadway, New York, N. Y., laboratory, Wyckoff Mills Rd., East Windsor Twp., $5,000,000.

▲ Pa., Fallsington—PLANT, etc.—Strick Trailer Co., Whitaker and Godfrey Aves., Phila., plans by George M. Ewing Co., Western Saving Fund Bldg., mfg. plant and office, $1,000,000. CD 3-28-56, under Pa., Phila.

▲ Tenn., Memphis—TIRE PLANT—B. F. Goodrich Rubber Co., 500 S. Main St., Akron, O., tire plant, $1,000,000. CD 8-28-58.

▲ Tex., Orange—PLANT—Spencer Chemical Co., Orange, polyethylene plant units, $2,000,000.

Wis., West Bend—FACTORY—Weasler Eng. & Mfg. Co., plans by Nete & Dies, 2120 W. Wells St., Milwaukee, Zone 3, 1 story, 120' x 140', concrete, steel, concrete block factory addn., $200,000.

UNCLASSIFIED

▲ Calif., Oakland—PARKS, etc.—City, City Hall, definitive bonds May 19, parks, $2,880,000; recreation, $2,835,000. CD 2-26.

▲ D. C., Wash.—STADIUM—District of Columbia Armory Bd., 2001 E. Capitol St., 50,000 seat stadium, west end of E. Capitol St. Bridge, $7,000,000-$8,000,000. Praeger-Kavanagh, 126 E. 48 St., Waterbury 16, N. Y.; Osborne Co., 7016 Euclid Ave., Cleveland, O.; George Dahl, 2101 N. St. Paul, Dallas, Tex.; and E&A Engineering Corp., 1147 Connecticut Ave., N.W., Wash., D. C., archts.-consult. engrs., CD 8-26.

▲ Florida—GAS TRANSMISSION LINES—The Houston Corp., 7100 40 Ave. N., St. Petersburg, gas transmission lines and distr. facilities, $72,000,000.

▲ Illinois—GAS MAIN—Chicago Dist. Pipeline Co., 122 S. Michigan Ave., Chicago, 50 mi. 16-in. gas main from Joliet to Calumet to Chicago and 2.4 mi. 10-in. lateral line, $12,900,000. FPC approved.

▲ Miss., Gulfport—PORT DEVELOPMENT—Gulfport Port Commission, long range port development program, $16,500,000. Tippetts-Abbett-McCarthy-Stratton, 82 W. 47th St., New York, N. Y., consult. engrs., making feasibility report. CD 8-1-49.

▲ Wash., Seattle—PIER—Port of Seattle, Bell St. Terminal, Zone 1, rebuild Pier 28, $3,500,000. G. T. Treadwell, Ch. engr. CD 3-13-47.

▲ West Virginia, Virginia and Maryland—NATURAL GAS PIPE LINE—Atlantic Seaboard Corp., 1700 MacCorkle Ave., S.E., Charleston, W. Va., 26 mi. natural gas pipe line, compressor stations, $6,869,000. CD 5-4-54.

Blaw-Knox self-aligning Airport Forms are placed easily by a small crew at Mather Air Force Base near Sacramento, California.

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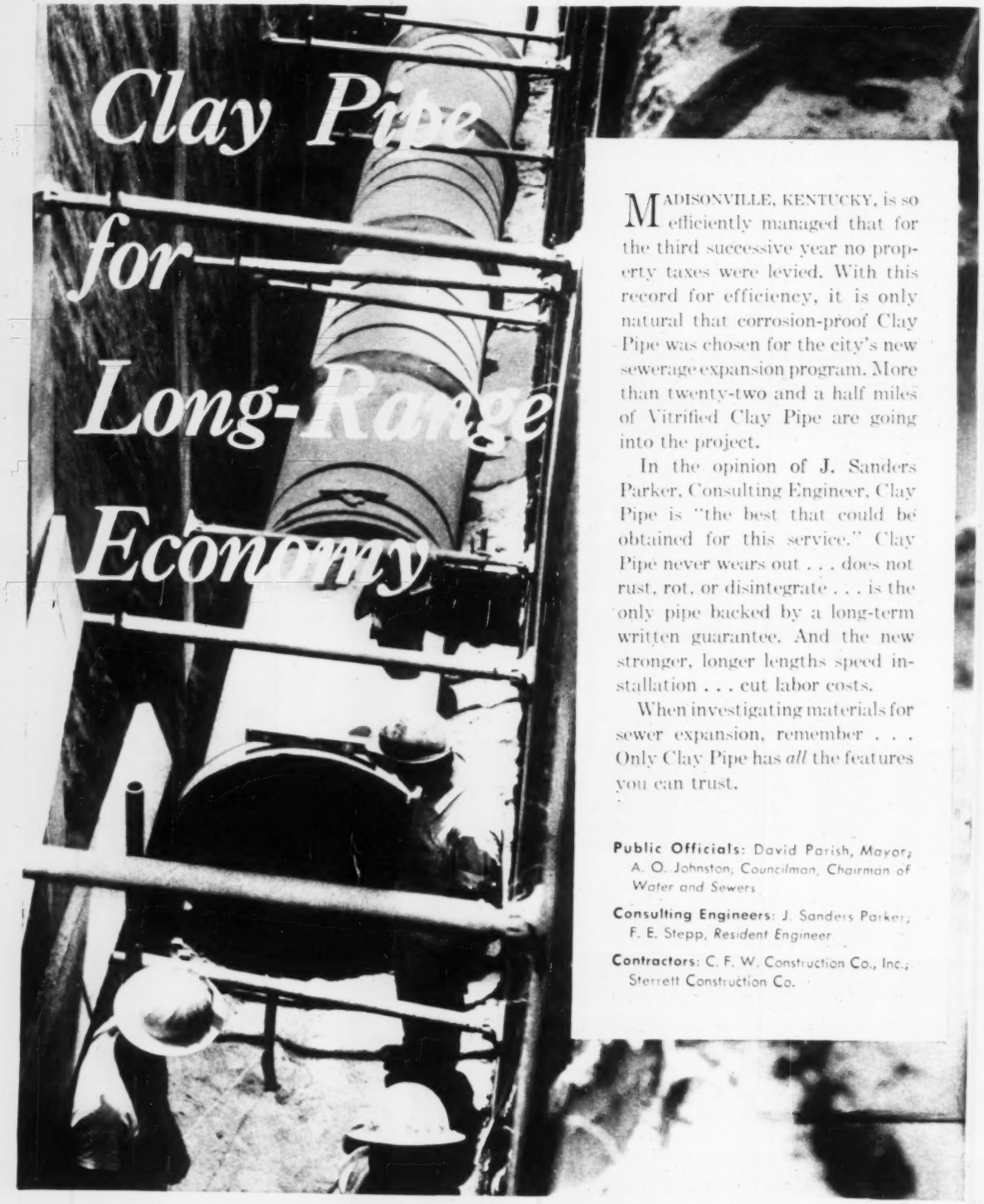

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Contractors: C. F. W. Construction Co., Inc.; Sterrett Construction Co.

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CONSTRUCTION REPORTS

Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

June 16 Massachusetts June 17 Maine
June 19 Vermont

BUILDINGS—BA

▲ Mass., Dalton—SCHOOL, BA, to 2o—Central Berkshire Regional School Dist., high school, $2,000,000. Plans deposit $100. Freeman, French & Freeman, 218 Bank St., Burlington, Vt., archts. Prentice Bradley, 74 North St., Pittsfield, assoc. archt. CD 4-9.

HEAVY CONSTRUCTION—LB & CA

▲ MASSACHUSETTS—Commonwealth of Mass., Dept. Pub. Wks., 100 Nashua St., Boston, Mass. Owner: Mass. Turnpike Authority. Contractor: M. DeMatteo Constr. Co., 200 Hancock St., North Quincy, Mass., CA, $5,221,390, est. $5,892,156, section Interstate Rte. 95, incl. bridges, approaches, FAP No. I-93-1(16) 23 & USG-118 23, Methuen. Bids Apr. 7. CD 4-9, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 16 Maryland

STREETS AND ROADS

June 17, 24 New Jersey July 10 Pennsylvania

BUILDINGS—BA

▲ N. J., Morristown—HOSPITAL—BA, 6/29—Bd. Trustees Morristown Memorial Hospital, Madison Ave., hospital addn., Madison Ave., $4,000,000. V. L. Falatico & Assoc., 26 Court St., Brooklyn, N. Y., engrs. Ferrenz & Taylor, 1451 Broadway, New York, N. Y., archts. CD 3-12.

BUILDINGS—LB & CA

▲ Transit Lanes, Inc., 5 Sugar Dr., Clarence, N. Y., Separate Contracts: $2,000,000, MEDICAL OFFICE and BOWLING ALLEY, Albert Rd., N. Y. Albert Rosenfeld, 263 Linwood Ave., Buffalo, N. Y., archt. CD 3-12.

▲ Caristo Constr. Co., 26 Court St., Brooklyn, N. Y., CA Est. $5,000,000. Guest HALL OF TECHNOLOGY and DORMITORY, University Campus, NEW YORK, N. Y. New York University, Washington Sq., New York 3, N. Y. CD 5-2.

▲ Shore Manor Homes, Inc., 27 Lennart Place, Passaic, N. J., Owner Builds, $7,500,000, 5,000 HOUSES, Browns Mills Rd., Browns Mills, 22 clusters, 1st unit, BROWNS MILLS, N. J., French Gershten, 118 Passaic St., Lyndhurst, N. J., archt.

▲ Terminal Constr. Co., State Hy. 17 and Maple Ave., P. O. Box 175, Wyckoff Rdge., N. J., LB, $21,777,000. Base Bid, alternate $23,339,000. 1,450 Unit Capehart HOUSING at Military Air Force Base, No. 2, WRIGHTSTOWN, N. J., Replacement Fire, McGuire Air Force Base, Wrightstown, N. J. Bids May 19. CD 4-24.

▲ Philip Vizzini & Son, 618 N. Frankstown Rd., Bldrs., Penn, Md., CA, $2,008,860. 1 unit 2 story Dormitory, Addn. to NAVAL Hospital, near Odenton, ANNAPOLIS, Md., Anne Arundel Co., Annapolis, Md. CD 4-9, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 16 South Carolina West Virginia
June 17 Louisiana June 23 Florida

STREETS AND ROADS

June 16 South Carolina West Virginia
June 17 Louisiana June 23 Florida

HEAVY CONSTRUCTION—LB & CA

▲ SOUTH CAROLINA—State Hy. Dept., Hugh Gourdin, Chief Engr., Columbia, S. C. Owner: Dept. of Corrections, Columbia, S. C. Contractor: Dickerson, Inc., P. O. Box 368, Moncks Corner, S. C., CA, $2,170,664. Base Bid, Unit 3, Lyles, 24-bed Rec. Bldg., Unit 4, Rehab. Bldg., Unit 5, Dorm. Bldg., Unit 6, Dorm. Bldg., Unit 7, Dorm. Bldg., Unit 8, Dorm. Bldg., Unit 9, Dorm. Bldg., Unit 10, Dorm. Bldg., Unit 11, Dorm. Bldg., Unit 12, Dorm. Bldg., Unit 13, Dorm. Bldg., Unit 14, Dorm. Bldg., Unit

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Mason Rd., F-004-1 (5) SR 22 Upson-Crawford Co. Line, Bids Mar. 20, awarded Apr. 23, CD 3-24, under LB.

▲ Empire Gas Eng. Co., 1958 Monroe, Dr., Atlanta, Ga., LB, $2,175,000, sewage treatment plant, CHATTANOOGA, TENN. City, City Hall, Chattanooga, Tenn. Bids May 26, CD 4-24.

BUILDINGS—LB & CA

▲† Ray M. Lee Co., 1004 Edward Ave. N. E., Atlanta, Ga., CA, $3,024,736, 3 story BARRACKS, 1 story CONSOLIDATED MESS and two 1 story ADMINISTRATION and STORAGE BLDGS., Redstone Arsenal, ENG-01-076-59-16, HUNTSVILLE, ALA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids May 19, CD 4-28.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS

June 16 Ohio — June 17 Michigan

▲† Illinois—BA 6/18—U. S. Eng., Merchandise Mart, Chicago, dredging and excavation Ca. Sag Channel, 3 million cu. yd., No. 11-032-59-23, $4,250,000, Extended date, CD 4-22.

BUILDINGS—LB & CA

▲ Comte Constr. Co., 912 Summit St., Toledo, O., CA, Total est. $2,010,000, general contract five unit HIGH SCHOOL, southwest corner Sylvania Ave. and Monroe St., TOLEDO, O., Sisters of Notre Dame, 1111 W. Bancroft, Toledo, O., Munger, Munger & Assoc., National Bank Bldg., Toledo, O., archts., CD 11-11.

▲ Turner Constr. Co., Gwynne Bldg., Cincinnati, O., CA, 1 story, 80,000 sq. ft. steel, concrete asbestos CEMENT PLANT to produce floor tile, CHILLICOTHE, O. Johns-Manville Corp., 22 E. 40th St., New York 16, N. Y. Graham, Anderson, Probst & White, 201 N. Wells, Chicago, Ill., archts., CD 5-28.

▲ Wilputte Coke Oven Div. Allied Chemical Corp., 40 Rector St., New York 6, N. Y., CA, rebuilding 84 unit COKE BATTERY, Brier Hill Works, YOUNGSTOWN, O. Youngstown Sheet & Tube Co., 2679 W. Federal, Youngstown, O.

▲ Dravo Corp., Neville Island, Pittsburgh, Pa., CA, design and construct 3,000 ton per day cap. SINTERING PLANT, CHICAGO, ILL. Interlake Iron Corp., Union Commerce Bldg., Cleveland 14, O., CD 10-2-57.

▲ Chicago Bridge & Iron Co., 332 South Michigan St., Chicago 4, Ill., CA, tank fabrication and erection 3,000,000 bu. GRAIN ELEVATOR addn., 122nd St. and Torrence Ave., CHICAGO, ILL., Cargill, Inc., 122nd and Torrence Ave., Chicago, Ill., Total est. $2,600,000, Awarded May 26:
W. M. La Bastille, Inc., 53 W. Jackson Blvd., Chicago 4, Ill., CA fdn. and mechanical contract (Chicago, Ill.);
Hoffman Electric Co., 400 N. St. Louis Ave., Chicago, Ill., CA, electrical contract (Chicago, Ill.);
Rolfes Electronics Corp., 708 Allen St., Boone, Iowa, CA, temperature detection sys., (Chicago, Ill.);
S. G. Hayes & Co., 162nd and Western Sts., Harvey, Ill., CA, roadway (Chicago, Ill.);
Chuck's Motor Service, 10558 Avenue N, Chicago, Ill., CA, excavating (Chicago, Ill.).

▲ Hope Constr. Co., 3920 N. Knox Ave., Chicago, Ill., CA, $2,500,000 Palatine Plaza SHOPPING CENTER, 31 stores, Northwest Highway and Hicks Rd., PALATINE, ILL., Robert R. Schen, 33 N. LaSalle St., Chicago, Ill., Awarded May 28, CD 3-6.

▲ Federal Products Corp., 1620 West Thompson St., Philadelphia, Pa., LB Est. $22,440,000 (3 bidders), superstructure for POST OFFICE, leasing by Post Office Dept., DETROIT, MICH., U. S. Post Office Dept., 12th & Pennsylvania Ave. N.W., Wash., D. C. Bids May 28, CD 5-21.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES

June 17 Arkansas — June 25 Missouri

STREETS AND ROADS

June 17 Arkansas — June 19 Minnesota
June 25 Missouri

▲† Kan., Topeka—MISCELLANEOUS—BA 6/24—U. S. Eng., 1805 Federal Office Bldg., Kansas City, Mo., Missile Complex, 11 F. O. & M. Facilities, Forbes Air Force Base, ENG23-028-59-72, CD 6-1.

BUILDINGS—BA

▲ Minn., Columbia Heights—SCHOOL—BA 7-1—Bd. Educ. Independent School Dist. No. 13, 4 story Senior High School, $2,500,000, Plans deposit $50, Toltz, King, Duvall, Anderson & Assoc., 1408 Pioneer Bldg., St. Paul, archts., CD 12-17.

BUILDINGS—SLC

▲ Minn., Minneapolis—STEAM GENERATING PLANT—Northern States Power Co., 15 South Fifth St., solicits contract superstructure for Unit No. 4 addn. to 150,000-kw. steam generating plant south of Twin Cities on Minnesota River, Total est. $25,000,000, Pioneer Service & Eng. Co., 231 South LaSalle St., Chicago, Ill., engr., CD 4-6.

HEAVY CONSTRUCTION—LB & CA

▲ MISSOURI—State Hy. Dist., Jefferson City, Bids opened 5-27:
Mo., J. A. Tobin Constr. Co., 3701 Rainbow Blvd., Kansas City, Kan., LB $876,412 (5 bidders), graded earth, storm sewers, concrete pavement, 0.355 mi., Jackson Co.; LB $191,544 (7 bidders), graded earth,

(Continued on page 82)

Bethlehem Form Stakes
Easy to drive for fast anchoring

The strong projectile point on Bethlehem Form Stakes quickly penetrates even the hardest road base . . . speeds the anchoring of steel forms for highway work.

HIGH-STRENGTH STEEL

Bethlehem Form Stakes are made of high-carbon, high-strength steel. They can be driven with a sledge or with power tools. You can really treat them rough, for they have the toughness to withstand repeated battering. They are economical, too, because these rugged stakes can be pulled out and re-used, time after time.

BUNDLED FOR EASY HANDLING

The stakes are made in any diameter and can be furnished in various lengths. They come well strapped in one-man bundles which are easy to handle and store.

OTHER STYLES AVAILABLE

In addition to the plain-end stake which is commonly used, Bethlehem Form Stakes can also be supplied with chamfered ends and with upset ends, to meet special needs. Tell us about your requirements. Get in touch with the Bethlehem sales office nearest you. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor, Bethlehem Steel Export Corporation

BETHLEHEM STEEL

HERE'S UNDISPUTED PROOF FROM ENGINEERS WHO KNOW

up to 25% longer life with reduced piston travel

The important thing is that you prove this fact to yourself. The features of *any* engine mean nothing until *you* have proved them to your own satisfaction and believe them to be fact. That's why Clinton invites you to make your own grueling torture test on any Clinton Engine mentioned below. We want you to prove to yourself beyond question that a Clinton Engine lasts longer. Write Clinton to make arrangements for an engine torture test.

TAKE A LOOK AT THE PROOF FOUND IN ACTUAL COMPARATIVE TESTS

	Clinton A1690	"A"	"B"
Piston Displacement	16.3	14.88	14.21
Bore	2 13/16	2 5/8	2 5/8
Stroke	2 7/8	2 1/4	2 7/8
RPM @ 4½ Net BHP—70 lbs. PSI	3124	3422	3583
FPM Piston Travel	1367	1568	1568
Reduction in FPM @ 4½ HP	13%	X	X

CLINTON ENGINES CORPORATION
(Formerly Clinton Machine Company)
Engine Division • Dept. 173-C • Maquoketa, Iowa

ACKER AP EARTH AUGER

The world's most versatile soil sampling rig

- **Soil Sampling**
- **Penetration Tests**
- **Drive Sampling**
- **Diamond Bit and Shot Core Sampling**
- **Developing Rock Profiles**
- **Permeability Tests**
- **Locating Borrow Pits**
- **Plotting Water and Sewer Main routes**

dozens of other applications

You can obtain accurate sub-surface information with the remarkably versatile Acker Earth Auger. Its design and built-in features permit speedy earth sampling with either large diameter single flight or continuous flight augers. The patented hydraulic head permits pressing samples or coring with diamond or inexpensive shot core bits. A rugged built-in hoist is handy for driving casing, doing standard penetration tests, or hoisting operations.

Whatever your soil sampling requirements may be, chances are, that this inexpensive, portable earth auger will do it better! You'll be surprised at the capacity and price of this incomparable rig!

Write today for Bulletin 40-R or 16mm sound movie on loan basis.

ACKER DRILL CO., Inc. P.O. BOX 830 SCRANTON 2, PA.

Over 40 years of experience manufacturing a complete line of diamond and shot core drills, accessories and equipment.

(Continued from page 80)

culverts, 24 ft concrete pavement, 0.771 mi, Osage Co.; LB $214,016 (7 bidders), graded earth, culverts, 24 ft concrete pavement, 0.979 mi, Cole Co.; LB $1,072,540 (3 bidders), graded earth, culverts, 2-24 ft concrete pavements, 5.627 mi, Platte Co.;

Mo.—Reno Constr. Co., Inc., & Sevenson Constr. Co., P. O. Box 61, Overland Park, Kansas, LB $2,048,468 (3 bidders), graded earth, storm sewers, concrete pavement, 0.931 mi, Jackson Co.;

Mo.—Fred Weber Contr., Inc., 7929 Alabama Ave., St. Louis 11, Mo., LB $1,799,693 (6 bidders), graded earth, culverts, 3 multiple lanes concrete pavement, variable width, 1.038 mi, St. Louis City, CD 4-10;

▲ Arkansas Louisiana Gas Co., Slattery Bldg., Shreveport, La., Owner Builds, $2,500,000, 100 mi, 6 in. natural gas line from Clarksville, Johnson Co., to Perea, Hot Springs Co., ARKANSAS, CD 11-18.

BUILDINGS—LB & CA

▲† D & L Constr. Co. & Assocs., 13238 Sherman Way, North Hollywood, Calif., CA $11,205,000, 700 unit units, Capehart HOUSING, ENG-23-028-59-61, FORT LEONARD WOOD, MO., U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., Bids May 7, CD 5-13, under LB.

▲† Beacon Constr. Co. of Massachusetts, Inc., Allston, Mass., LB $3,287,000, (3 bidders), 200 unit Capehart HOUSING, (s), ENG-23-028-59-43, Fort LEAVENWORTH, KAN., U. S. Eng., 1800 Federal Office Bldg., 911 Walnut St., Kansas City 6, Mo., Neville Sharp & Simon, 12th and Walnut Bldg., Kansas City, Mo., archts., CD 4-14, under LB.

▲† Burl Johnson Assocs., P. O. Box 4716, Tulsa, Okla., LB $4,842,523, 400 units Capehart HOUSING (Ns), 2nd Glasgow Air Force Base, GLASGOW, MONT., Procurement Office, Glasgow Air Force Base, Glasgow, Mont., Bids Apr. 30, CD 4-24.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
June 19, Arizona

HEAVY CONSTRUCTION—LB & CA

▲ ARIZONA, State Hy. Dpt., 206 S. 17 Ave., Phoenix; Martin Constr. Co., P. O. Box 934, Tucson, Ariz., CA $2,479,172, paving and 2 interchange structures, incl. major improvs. on U. S. 80, Pima Co., Bids May 29, CD 8-21.

▲ MacDonald & Kruse, Contractors, Box 306, 7640 Wheatland, Sun Valley, Calif., LB $2,861,125 (10 bidders), Soreson Ave. Storm Drain, Unit 2 and Proj. 17, Michigan Ave. Storm Drain, Unit 3, Whittier-Santa Fe Springs Proj., incl. excavating, rein.-con. open rectangular channel and rein.-con. box conduit and installing same, LOS ANGELES, CALIF., Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif., Bids May 29, CD 5-1.

BUILDINGS—LB & CA

▲ L. W. Johnson Co., 6th Ave. and Spring St., Seattle 1, Wash., and Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, CA $2,408,788, 5 story, 89,710 sq. ft., rein.-con. HOSPITAL, SEATTLE, WASH., Group Health Co-operative of Puget Sound, 15 Ave. N. and E. John St., Seattle, Wash., Bids Apr. 30, CD 5-6, under LB.

▲ George Belcher, No. 2 Terra Vista St., San Francisco, Calif., Owner Builds, $2,000,000, 11 story, lift slab prestressed concrete APARTMENT, 4 story PARKING GARAGE, 1800 Pacific Ave., SAN FRANCISCO, CALIF., August E. Waegemann, 251 Post St., San Francisco, Calif., archt.-engr.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 15, Ontario

HEAVY CONSTRUCTION—LB & CA

▲ Piggott Constr. Ltd., Saskatoon, Sask., LB $6,983,458, Stage 2, South Saskatchewan River Dam Embankment, involving 18,000,000 cu. yd. excav. and 14,000,000 cu. yd. compacted embankment, near Dundurn, SASKATCHEWAN, Prairie Farm Rehabilitation Admin., Regina, Saskatchewan, Bids May 28, CD 5-6.

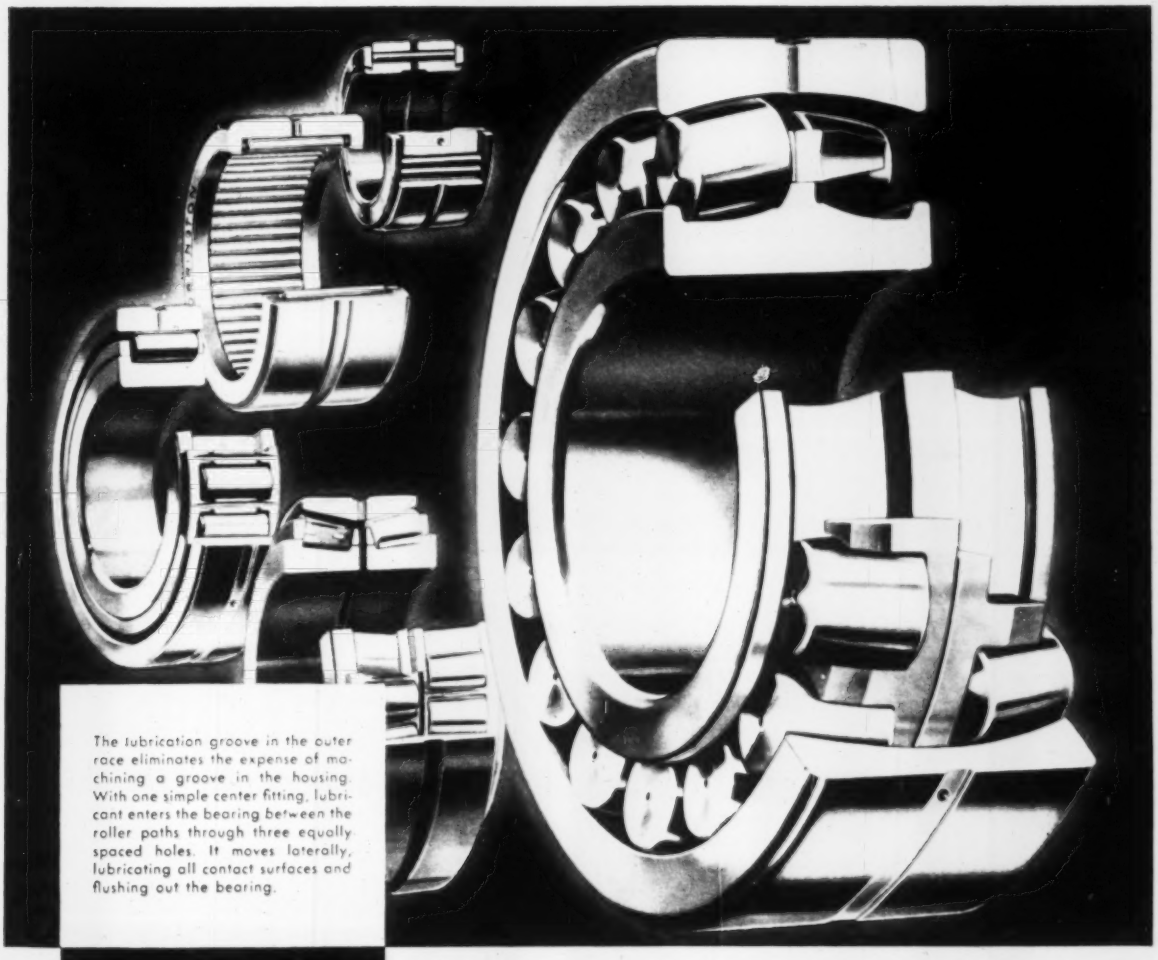
▲ Simard & Freres, Cie Ltee., 3033 Ch. St. Michel, Montreal, Que., CA $8,898,000, (4 bidders), elevated expressway portion of Cross-Island Metropolitan Blvd., passing alongside town of Mount Royal and city of St. Laurent, MONTREAL, QUE., Montreal Metropolitan Corp., 506 St. Catherine St. E., Montreal, Que., Bids May 28, CD 5-8.

▲ Fischbach & Moore of Quebec, Ltd., 5330 Royalmount Ave., Montreal, Que., CA $2,000,000, (3 bidders), electrical work at overhaul and maintenance base, Montreal Airport, DORVAL, QUE., Trans-Canada Air Lines, 1060 University Ave., Montreal, Que., Ross, Fish, Dichenes & Barrett, 4115 Sherbrooke St. W., Montreal, Que., archts., CD 1-6-58.

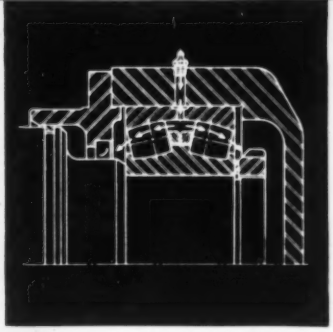
BUILDINGS—LB & CA

▲ Angus Robertson Ltd., 5035 Western Ave., Montreal, Que., CA Est. $2,000,000, (8 bidders), 244,000 sq. ft. WAREHOUSE, GENERAL OFFICES and SERVICE TRAINING CENTRE, Pointe Claire Industrial area, MONTREAL, G. General Motors of Canada Ltd., Oshawa, Ont., Zone Office, 4430 Cote de Liesse Rd., Montreal, Que., Bids May 31, CD 5-1.

(Proposed Advertisements see pp. 104 to 106)



The lubrication groove in the outer race eliminates the expense of machining a groove in the housing. With one simple center fitting, lubricant enters the bearing between the roller paths through three equally spaced holes. It moves laterally, lubricating all contact surfaces and flushing out the bearing.



A time-proved lubricating method now available on Torrington Spherical Roller Bearings

The circumferential groove in the outer race has met the test of experience in many Torrington Bearings, including Heavy Duty Needle Bearings, Aircraft Type Needle Bearings, Tapered and Radial Roller Bearings. Now the circumferential lubrication groove is available in Torrington Spherical Roller Bearings.

This design feature makes it possible to introduce lubricant *between* the roller paths without the expense of machining a groove in the housing. This groove is proportioned to provide generous lubricant flow capacity. Lubricant moves through the roller paths, flushing used lubricant and contaminants away from bearing contact surfaces.

Torrington Spherical Roller Bearings in many sizes may be ordered with this groove as desired at no additional cost. For further information, see your Torrington representative or write: **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

"Our Ford F-800's, pulling 20-ton payloads, give us mighty good service!"

says R. Dillard Teer, Vice President
Nello L. Teer Co., Durham, N. Carolina

"We operate about 115 Ford Trucks ranging in size from ½-ton pickups to Tilt Cab Tandem tractors. We believe in carefully fitting the truck to the job to be done and usually stay within the manufacturer's recommended ratings. We make an exception to this rule with our Ford F-800's, pulling 20-ton loads in aluminum trailer dumps to our quarry and crushing setup at Durham, North Carolina. These units are carrying the maximum legal limit and give us mighty good service!

"We haven't traded any trucks in about 6 years. It just happens that our company has been growing so rapidly that when we buy a new truck, usually an F-800, I put it under one of our trailer dumps. Then I'll take the old truck, lengthen the chassis, and make a grease outfit or a water wagon out of it. I would say out of over a hundred Ford units in the past 7 or 8 years, we have gotten rid of only a dozen altogether—and some of these were wrecked or burned.

"Another reason we use Fords is that this business is rough on trucks, so parts availability is very important. Our experience over the years with Ford as compared to Ford competitors has been definitely in favor of Ford on parts."

NOW! CERTIFIED PROOF!

FORD TRUCKS COST LESS

'59 Ford Pickups beat average mileage of other leading makes by 25.2% in Economy Showdown U.S.A.

Here at last is certified proof of the differences in gas mileage between six-cylinder pickups . . . evidence that you can use in your operation.

It was compiled by America's foremost independent automotive research firm after testing 1959 six-cylinder, ½-ton pickups of the six leading makes. All trucks were bought from dealers—just as you would.

The tests paralleled every kind of driving—high speeds and low, open highways and city traffic, even door-to-door delivery. And in every test, '59 Ford Sixes delivered more miles per gallon than any other make. Here are the actual percentages:

'59 FORD PICKUP SIXES GAVE

42.6% better mileage than make "D"
31.1% better mileage than make "I"
25.2% better mileage than make "C"
22.0% better mileage than make "S"
9.6% better mileage than make "G"

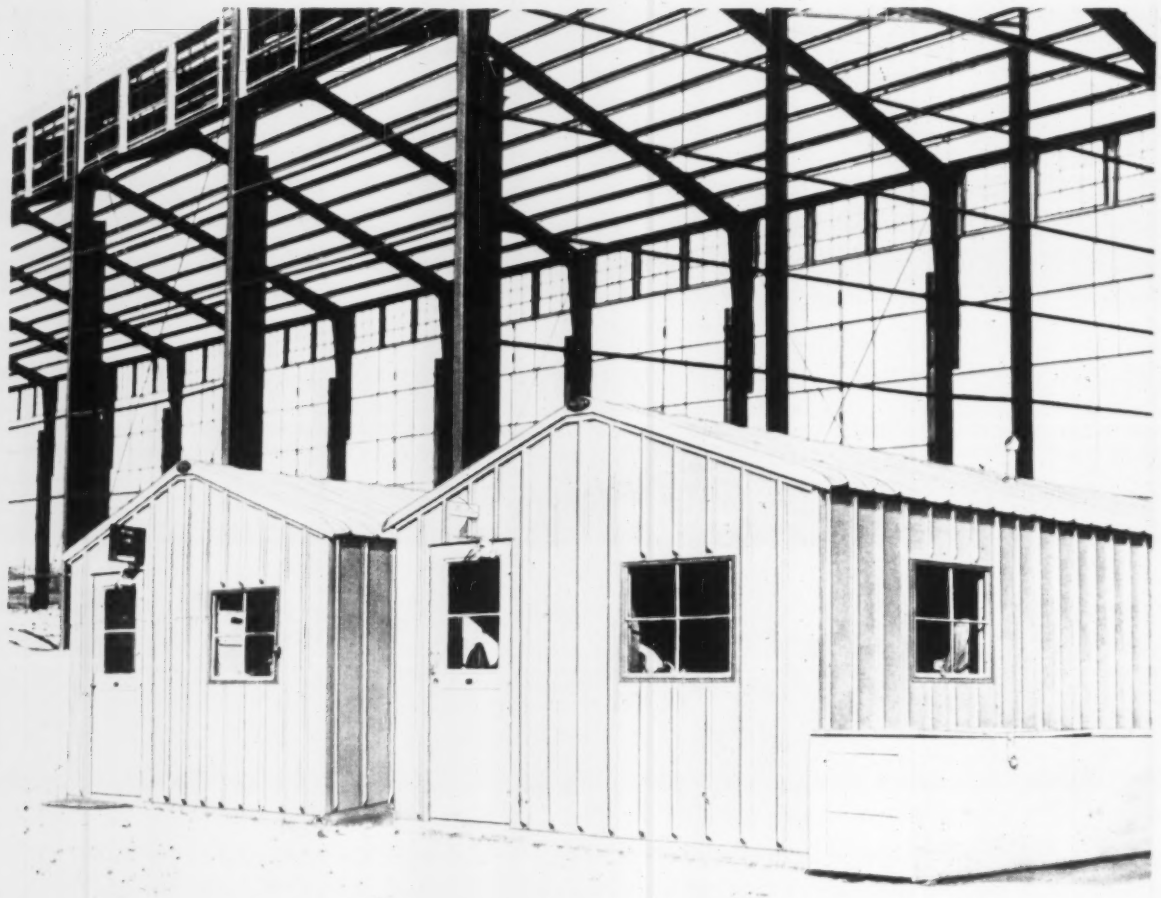
Taken together, Ford got 25.2% more miles per gallon than the average of all other leading pickups!

What's the secret of Ford's economy? First, of all pickup sixes, only the Ford Six has modern Short Stroke design which reduces friction and requires less fuel. Second, to this modern engine, Ford has added a new economy carburetor to meter fuel more precisely in both high- and low-speed ranges.

See your Ford Dealer for the full report of Economy Showdown U.S.A. and get the whole story firsthand.

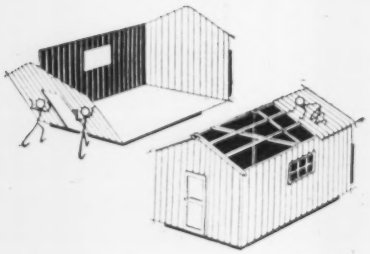
All tests conducted and results
CERTIFIED
by America's foremost independent automotive research organization*
***NAME AVAILABLE ON REQUEST**
Send inquiry to P.O. Box 2687, Ford Division
Ford Motor Co., Detroit 31, Michigan

Now! During Dividend Days at your Ford Dealer's... Go *FORD*-ward for Savings



Have Butler Panl-Frame...will travel

the building that moves fast and easy



Panl-Frames go up in hours. Panels can be pre-assembled into large sections and tilted into place on most any type foundation. Bolt-together construction provides maximum rigidity . . . permits relocation with 100% salvage of materials. Firesafe, all-steel construction. Available in wide range of sizes.

Here's a utility building that's made-to-order for the fast moving construction industry. On a new job it can be erected and ready for use in just hours. And, when you're ready to move on, Panl-Frame buildings are as easy to dismantle and move as they are to erect.

Don't confuse Panl-Frames with temporary "jerry-built" structures. They are top quality utility buildings. The cover panels, including curved eave, roof ridge, roof and wall panels and one-piece corner panels, are all die-formed to fit together perfectly. They provide weather-tight construction . . . create a neat, business-like building that you can be proud of.

If you're in the market for field offices, tool houses, supply depots, warehouses, machine shops, mess halls or bunk houses that can go anywhere you go, contact your Butler Builder. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings." Or write direct for free literature.

BUTLER STEEL PRODUCTS

BUTLER MANUFACTURING COMPANY

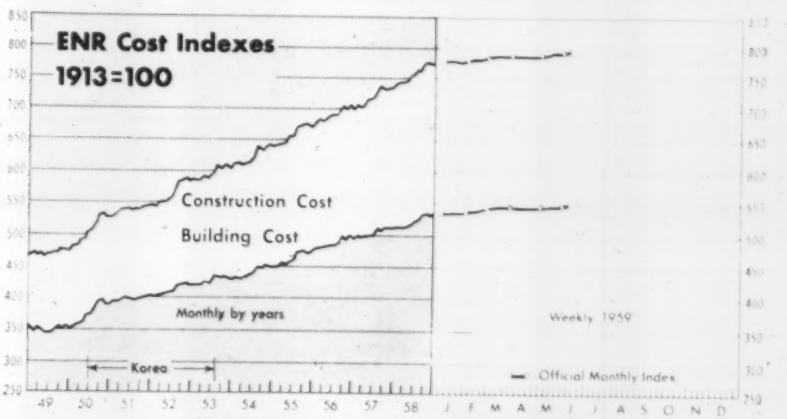
7418 East 13th Street, Kansas City 26, Missouri

Manufacturers of Metal Buildings • Equipment for Farming, Dry Cleaning, Oil Production and Transportation, Outdoor Advertising • Contract Manufacturing

Sales offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. • Detroit, Mich. • Cleveland, Ohio Pittsburgh, Pa. • New York City and Syracuse, N.Y. • Boston, Mass. • Washington, D.C. • Burlington, Ontario, Canada

Construction Scoreboard

CONTRACTS ...



CURRENT COST INDEXES

ENR INDEXES (1913 = 100), 20-cities average	Week of June 4 1959	% Change from May 7 1959	% Change from June 5 1958
Construction Cost	797.94	+0.9	+3.3
Building Cost	549.21	+0.7	+3.3

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.650; Building Cost by 1.840.
To convert above indexes to 1949 = 100: Divide Construction Cost by 1.770; Building Cost by 1.518.

AMOUNT OF CONTRACTS LET

	This Week millions	Cum. 24 wks 1959 millions	Cum. 24 wks Chge '58-'59 %
All Heavy Constr	$522.8	$9,309.8	+ 7
By Ownership			
PRIVATE	252.5	4,553.0	+ 16
PUBLIC	270.3	4,756.8	- 1
State & Municipal	211.8	3,363.6	- 5
Federal	58.5	1,393.2	+ 11
By Type of Work			
PUBLIC			
Waterworks	5.0	198.2	+ 36
Sewerage	15.0	285.0	+ 8
Bridges*	14.8	271.2	+ 11
Highways	105.8	1,103.1	+ 4
Earthwork, Waterways	18.4	376.6	- 31
Buildings, Excl. Housing	70.5	1,254.6	+ 5
Housing	21.5	429.7	- 36
Unclassified	19.2	641.6	+ 11
PRIVATE			
Buildings			
Mass Housing	112.1	2,062.7	+ 17
Commercial	55.5	1,026.8	- 7
Industrial	58.1	1,255.1	+ 32
Unclassified	26.6	205.2	- 8

*Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $210,000; other buildings, $400,000.

CONTRACTS AWARDED

	1959 May millions	1959 5-Mos. millions	% Change from 1958 May	% Change from 1958 5-Mos.
Total U. S., ENR reported	$1,966.7	$8,471.3	-15	+10
Private	1,007.9	4,122.5	+ 4	+17
Public	958.8	4,348.8	-28	+ 4
State and Municipal	658.4	3,047.6	-29	- 4
Federal	300.4	1,301.2	-27	+28
ENR Volume Index, 1913 = 100	700	550	+ 4	+ 6

NEW CONSTRUCTION CAPITAL

	1959 May millions	1959 5-Mos. millions	% Change from 1958 May	% Change from 1958 5-Mos.
Total U. S.	$848.1	$4,679.7	-36	-26
State and Municipal Bond Sales	395.8	2,887.1	-54	-11
Corporate Security Sales	437.8	1,730.2	- 4	+29
Federal Loans, Aid (nonfederal work)	14.5	62.5	+35	-23
Federal Appropriations (federal work)	0	0		-100

MATERIALS SHIPMENTS

	Unit	1959 Feb.-Mar.-Apr.	1959 Cum. No. of Mos.	Percent Change from Year Ago Mo.	Percent Change from Year Ago Cum.
Portland Cement, Bur. Mines	thous bbls	30,135 A	82,253.4	+19	+22
Concrete Paving Awards, PCA	thous sq yd	8,960 A	32,147.4	-33	- 4
Fabricated Structural Steel	thous tons	291 A	992.4	10	-21
Bookings, AISC	thous tons	295 A	1,080.4	+42	+11
Reinforcing Bars, Net, AISI	thous tons	254 A	766.4	+44	+11
Lumber, NLMA	mil fbm	3,271 A	11,678.4	+16	+17
Orders	mil fbm	3,255 A	11,871.4	+13	+17
Production	mil fbm	3,121 A	11,332.4	+17	+13
Clay Products, Bureau of Census					
Brick, Unglazed, Common, Face	mil bri	333.6 F	753.7.2	+44	+24
Vitrified Clay Sewer Pipe	thous tons	99.8 F	201.2.2	+38	+16
Structural Tile, Unglazed	thous tons	31.6 F	72.9.2	+13	+ 7
Asphalt Products, Bureau of Census					
Asphalt Roofing	thous sales sqs	6,950.3 M	13,013.4.3	+95	+14
Asphalt Siding	thous sales sqs	110.4 M	231.4.3	+98	+35
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate, non-heat treatable	mil lbs	107.6 M	277.2.3	+61	+10
Wire and Cable	mil lbs	22.0 M	70.2.3	- 9	+12
Extruded Shapes, soft alloys	mil lbs	66.4 M	183.6.3	+43	+31

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	2,634 A	2,411.1**	+ 6	+ 3
Contractor Failures, Dun & Bradstreet					
Number		166 A	703.4	21	- 8
Liabilities	thous	$8,623 A	$35,397.4	10	-12

**Average per month

CAPITAL . . .

New Capital For Construction	Week of June 4 millions	Cum. 23 wks 1959 millions	Cum. 23 wks Chge '58-'59 %
Corporate Securities	$196.6	$1,926.7	-24
State and Municipal:			
All Except Housing	112.4	2,968.9	-11
Housing		30.6	+29
Federal Loans	1.5	64.0	-23
Federal Aid	18.0	18.0	
Total Nonfederal	$328.4	$5,008.1	-16
Federal Appropriations:			
Projects in U. S.	38.3	38.3	-94
Out-side U. S.			
Total New Capital	$366.7	$5,046.4	-23

Tough Job Tests Machine Efficiency...

CONTRACTOR CONVINCED ALLIS-CHALMERS COMBINATION IS BEST CHOICE

St. Paul, Minn.—Loading rock-laden, sandy clay—then spreading in swampy muck and loose sand provides a real test of earth-moving efficiency. Kimmes-Bartelma Construction Company applied its Allis-Chalmers fleet to just such conditions on a 1,900,000-yard segment of St. Paul's new freeway system. The Hastings, Minnesota, contractor's TS-360 motor scrapers with HD-21 pushers handle the demanding job faster and at lower cost than any other combination of machines available, partner Charles Bartelma reports. He thoroughly tested three other well-known makes—convinced himself that his Allis-Chalmers fleet is the best choice.

Kimmes-Bartelma is handling the clearing, grading and sub-base preparation on a 2.9-mile section of the north approach to the proposed St. Paul freeway (trunk highway 35-390). Work on the $1,469,000 contract started in October, 1958, and the job is expected to be completed by July, 1959. Approximately 10% of the 1,900,000 yards of excavation is swamp work. Dragline-loaded, tractor-drawn scrapers haul out the muck ... motor scrapers bring in sand fill ... tractor-dozers spread it into the mucked-out areas where it is compacted to specifications.

Sylvester Kimmes, partner
Kimmes-Bartelma Construction Company
Hastings, Minnesota

Charles Bartelma, partner
Kimmes-Bartelma Construction Company
Hastings, Minnesota

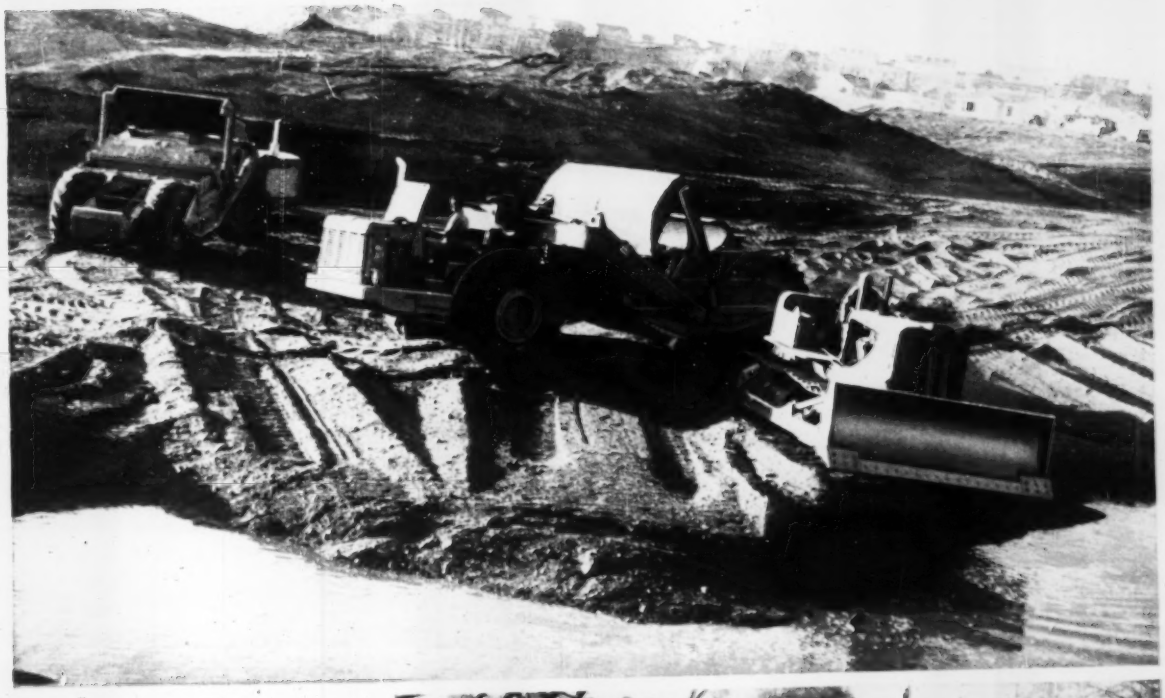
The motor scrapers get a workout on both ends of the haul. The dead, rock- and sand-laden clay is tough to load ... yet the TS-360's, with assists from torque converter HD-21's, get good loads in 30 to 35 seconds. At the other end of the haul, the scrapers spread in soggy, mucked-out swamp holes. Even as the fill progresses, loose sand slows spreading.

A compensating factor, however, is the finely dressed haul road maintained by an Allis-Chalmers FORTY FIVE motor grader. The excellent condition of the haul road permits scrapers to highball the 2,300-foot

Allis-Chalmers TS-360 with HD-21 pusher gets good loads of dead, sandy clay in as little as 30 seconds.

Much of the credit for excellent cycle time goes to the Allis-Chalmers FORTY FIVE motor grader which keeps haul roads in top condition.

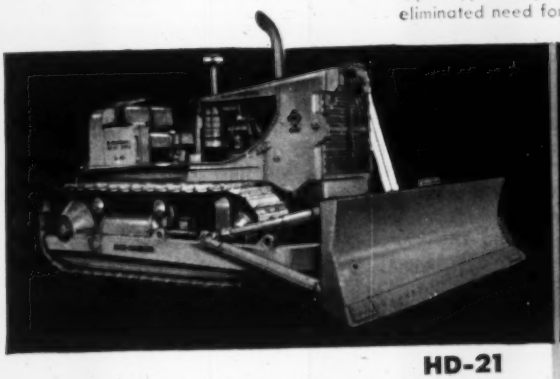
...move ahead with



Allis-Chalmers tractor-dozers push fill into swamp holes which had been mucked out by tractor-scrapers and draglines.

haul . . . cut average cycle time to 3 minutes, 33 seconds. Bartelma calls this good time in *any* conditions . . . *excellent under those prevailing on this job.* "The low, wide bowl makes loading easy and the forced ejection gets all material out in a hurry," he said. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

Open-type design of these Allis-Chalmers pull scrapers permitted dragline loading of muck eliminated need for special added equipment.



HD-21

225 net engine hp Torque converter drive
56,260 lb approx. as shown

TS-360

20-yd capacity 280 horsepower
49,050 lb

ALLIS-CHALMERS... power for a growing world

US Bond Moves Jolt Borrowers

- **Talk of raising interest-rate ceiling pushes borrowing costs up as lenders await Administration's decision.**
- **Builders are jittery over plans to swap government-backed mortgages for U. S. bonds. They fear an adverse effect on 1960 sales.**

A U. S. Treasury cat jumped out of the bag this week when President Eisenhower asked Congress to raise or remove the present 4.25% interest-rate ceiling on government bonds.

Two other Administration financial cats have been out and running. They are:

• A proposal for increasing the federal debt limit to $295 billion. It's now at $288 billion, but is scheduled to drop to $283 billion at the end of this month.

• The Federal National Mortgage Association (Fannie Mae) is considering exchanging some of its holdings of government-backed home mortgages for outstanding government bonds. The bonds received would then be retired by the Treasury.

If these proposals become fact, the cost of borrowing will go up for individuals, corporations, states and municipalities. The interest-rate boost on government bonds and the mortgage-government bond swap would act directly. The higher debt ceiling would have an indirect, psychological effect by further confirming predictions that inflation will continue to reduce the purchasing power of the dollar.

The talk of a higher ceiling on government bonds has had a sharp effect on outstanding negotiable bonds of all types. For example, on May 28, of 26 Treasury bonds, five were yielding 4.25% or more up to 4.33%. Seventeen were yielding from 4.04% to 4.24%, and one was yielding 4%. Three were yielding from 2.86% to 3.83%.

But at the end of last week, 14 of these bonds were yielding from 4.27% up to 4.50%. Nine yielded from 4.04% up to 4.22%. Three were yielding 2.98% to 3.87%.

Corporate, state and municipal bonds followed along, but not quite as dramatically as the federal government's debt issues. And new corporate and municipal offerings will reflect the new cautious mood of investors and the bond underwriters. This caution will be apparent this week when California takes bids on $100 million worth of bonds. Connecticut Turnpike issues totaling $62.5 million are also expected to come into the market. These will provide another indication of how much borrowers will have to pay.

The uncertainty in the money market, with tendency to the high side, will remain until a final decision on the interest ceiling is made by either Congress or the Administration.

Republicans in Congress are hoping the Administration plans to fight for its request.

This is the GOP reasoning:

Democrats blast high interest rates, but, if cornered, they will agree to the ceiling boost rather than risk being labeled inflation-minded, "cheap money" advocates. GOP strategists point to Democratic support this session for a higher interest rate on housing mortgages backed by the Veterans Administration, a move contrary to the Democratic Party's traditional low-interest philosophy.

Democrats may prolong the controversy to get whatever political mileage they can. No matter how they vote, the Democrats will assail the Administration for fostering higher interest rates.

While the effect of the possible interest ceiling boost was immediate in the bond markets, neither that prospect nor the proposal for a mortgage-bond swap has had an immediate effect in the mortgage market.

Builders generally have agreements with lenders for financing of their housing starts this year, which will hit 1.3 million or so.

But 1960 may be a critical year for housing. The homebuilding industry is worried about next year and the proposed Fannie Mae swap of its holdings is adding to the concern.

J. Stanley Baughman, president of Fannie Mae, says the agency is considering a $200-million exchange. If the idea is well-received, the amount may go to $1 billion.

Any such exchange could reduce by an equal amount, or close to it, the amount of new mortgages lenders would accept. Banks diversify their investments; mortgages are only a portion of it. Loading up with government-backed mortgages, while eliminating holdings of government bonds, will encourage, if not force, some lenders into investing in other than mortgages.

But this isn't the only problem. The homebuilding industry plumped for a boost in the VA mortgage interest rate. Congress agreed. When a housing bill finally clears Congress, it will almost certainly contain a provision boosting the rate to 5.25% from its present 4.75%. The new rate will make it equal to that of the mortgages insured by the Federal Housing Administration. FHA borrowers, however, pay another 0.5% for the insurance premium. This goes to FHA, with the lender collecting only the 5.25%.

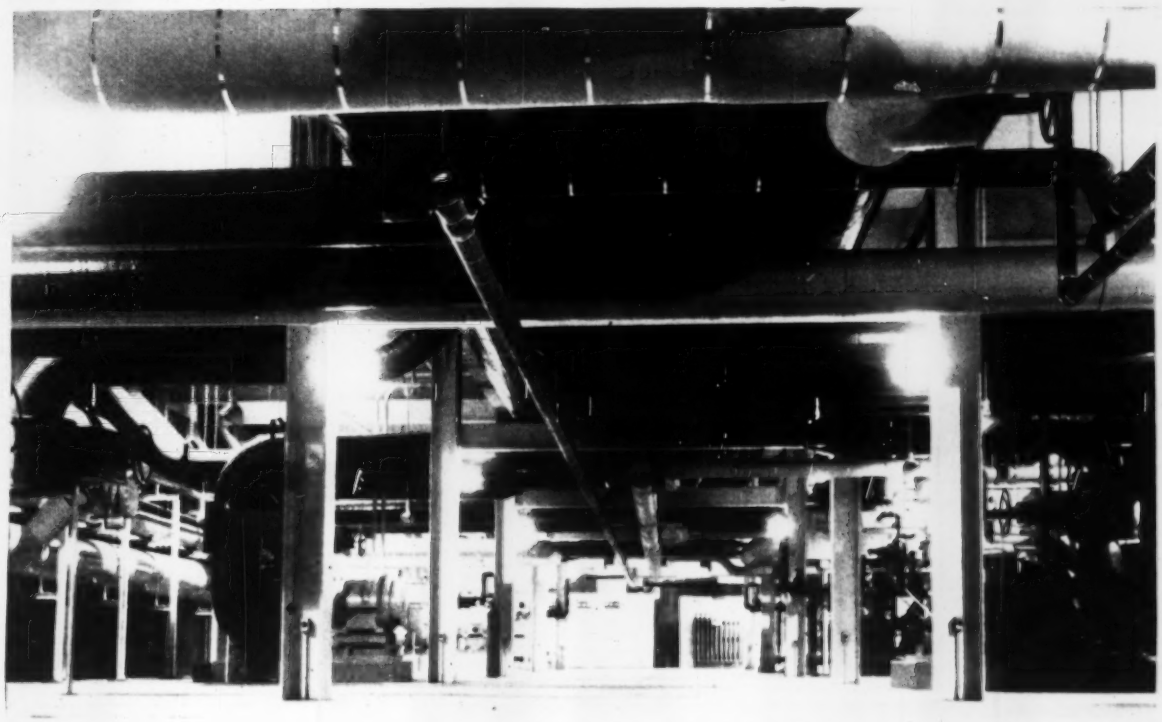
Therefore, parity of rates technically could make VA mortgages at 5.25% more attractive to lenders than FHA's. Reason: A defaulted VA mortgage is paid off in cash up to $7,500. The difference between the $7,500 and remaining indebtedness is recaptured easily by resale, since the difference would be small. When an FHA mortgage is defaulted, it is paid off with FHA debentures drawing less than 3% interest. These mature three years after the original terminal date of the mortgage, had it not been defaulted. Obviously, the cash is preferred, for it can be invested immediately at going rates.

A chain reaction could thus occur. FHA might have to lift the allowable rate on mortgages it insures above that of the VA rate. (FHA has the administrative authority to move the rate up to a maximum of 6%. VA rate is controlled by Congress.) Then VA mortgages once more would lose some of their appeal, particularly if interest rates should remain generally high. Then another clamor for higher VA rates, and the vicious cycle becomes even more vicious.

Both House and Senate housing bills contain provisions granting $10 billion in new authority to the FHA.

(*B&F continued p. 92*)

The face of a commercial center



Architects and Engineers: Lane, Gamble and Associates; General Contractors: Robert E. McKee, Inc., and J. E. Morgan and Sons; Heating and Plumbing Contractors: Kieffer Plumbing and Heating Co., and Sam P. Wallace and Co.; Mechanical Engineers: Blum and Guerrero, and William K. Hall and Co.

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Business Spending Plans Up 7%

Government survey shows investment plans for new plants and equipment have been revised upward

Industry's drive to modernize its plants and equipment is quickening.

The latest government survey shows expenditures planned for this year are 7% over 1958 outlays. Last March the survey indicated only a 4% hike. (McGraw-Hill's capital spending report in April indicated a 7% rise in spending plans for this year—ENR Apr. 17, p. 23.)

Last year's outlays came to $30.9 billion. This year business plans to spend $32.6 billion.

That's still a long way from the previous all time high of almost $37 billion, reached in 1957.

But the jump in the annual rate of outlays from the first quarter of this year to the current quarter shows what's happening. The increase is $1.7 billion—and there hasn't been a single quarter gain that large since the great capital spending boom of 1956 was approaching a peak. In 1956, the second quarter also showed a $1.7 billion gain in annual rate.

The government survey, taken jointly by the Securities and Exchange Commission and the Commerce Department, does not show how much of the planned expenditures will go for new construction and how much for new machinery and equipment in existing structures.

Officials ask for that information only once a year. But they don't publish it because many key companies fail to supply the data. On an average, however, one third of capital and equipment outlays goes for construction, government analysts figure.

In the last couple of years the proportion has been less than one third, as industries stressed modernization of equipment in preference to expanding floor space. The result has been a sharp decline in factory construction.

The lag in construction compared to equipment expenditures probably will continue through 1959, government experts believe.

This is hazardous forecasting, as the government analysts well know, since it depends on general business conditions two years in the future.

Most industries are busy drawing plans for new—and larger—spending this year.

Only three major industry groups still have their sights set lower than in 1958.

Public utilities plan to spend $5.9 billion this year compared to $6.0 billion in 1958; within this total, electric utilities are planning a contraction while gas utilities continue to raise outlays to construct natural gas lines. Chemical and non-ferrous metals companies are also planning to cut outlays under last year.

Primary iron and steel is a surprise. Instead of the drop expected in the March survey, a gain of 7% is now found to be in the works.

Textile mills are showing one of the largest percentage gains—more than one third over last year.

Here is a quick look at the 1959 projections compared to the 1958 actuals:

	Actual 1958	Anticipated 1959	Percent Change
	(millions of dollars)		
Manufacturing	$11,433	$12,395	8%
Durable-goods	5,469	6,012	10
Nondurable-goods	5,964	6,383	7
Mining	941	982	4
Railroad	754	867	15
Transport, other than rail	1,500	1,986	32
Public Utilities	6,088	5,891	−3
Commercial and other	9,810	10,444	6
Total	$30,526	$32,565	7

More Contractors Than Ever

A record number of contractors is competing for construction contracts this year, according to the U. S. Department of Commerce. A new report covering the last eight years shows 475,900 contractors doing business at the start of this year. That's about 2% more than the year before.

The survey reveals two noteworthy facts about contractors:

- The number of construction firms has grown faster than any other type of business, except in 1958.
- When the construction business was good, the number of new firms grew rapidly. When business fell off, so did the number of new contractors.

One of every five industrial companies established in the U. S. since 1951 has been a construction company. The number of U. S. companies of all kinds climbed to a record 4,589,200 as of January 1, 1959—a gain of 521,900 since 1951. Construction companies accounted for 19% of this, or 98,600.

Contract construction firms have increased 26% since 1951, faster than any other segment of the business population. Only finance, insurance and real estate firms, with a growth rate of 23%, came close to construction. The overall growth of business firms in that period was only 13%.

Following the sharp rise in construction contracts in 1952 (over 1951) construction contractor firms in operation on Jan. 1, 1953, rose 4.7%. With even the modest dip in construction contracts in 1953-54, the growth rate of construction firms slipped to about 3% on Jan. 1, 1954 and 1955.

Then, as contract volume shot up in 1955, there was a net increase of more than 5% in contract construction firms operating as of Jan. 1, 1956.

Though construction contracts rose another 16% in dollar volume during 1956 to an all-time record, competition cut the net increase in firms to 3% by Jan. 1, 1957.

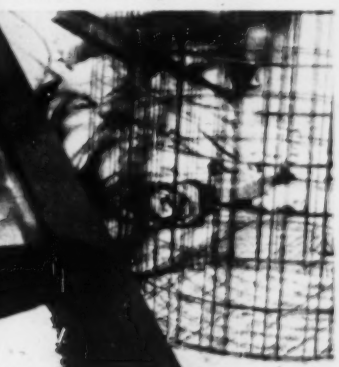
And when the slump in contracts hit the construction market in 1957, the net gain in contractors in business as of Jan. 1, 1958, dropped to only 0.5%.

How contractors growth compares with other industries

As of Jan. 1	All Industries Number (Thous.)	All Industries Annual Change (Percent)	Contract Construction Number (Thous.)	Contract Construction Annual Change (Percent)	Contractor Changes by Years New	Discontinued	Transferred
1951	4,067.3	....	377.3	....	53,700	43,900	11,300
1952	4,118.2	+1.3	387.3	+2.6	61,500	43,300	11,900
1953	4,187.7	+1.7	405.3	+4.7	59,800	48,500	13,500
1954	4,239.8	+1.2	416.7	+2.8	61,600	48,400	13,200
1955	4,286.8	+1.1	429.8	+3.1	68,700	46,800	13,400
1956	4,381.2	+2.2	451.7	+5.1	68,000	54,300	14,000
1957	4,470.7	+2.0	465.4	+3.0	56,100	54,000	13,200
1958	4,534.4	+1.4	467.6	+0.5	60,500*	52,200*	12,100*
1959	4,589.2*	+1.2	475.9*	+1.8	n.a.	n.a.	n.a.

* Based on incomplete data n.a. not available Commerce Dept. Data

Pre-stressed concrete structural member removed from forms which have been sprayed with Shell Form Compound. Note the smooth, pit-free surfaces.



Shell Form Compound is applied quickly with standard spray equipment.

NEW spray-on release agent for all concrete forms

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- ✔ Leaves glossy surface on concrete member
- ✔ Keeps forms clean . . . no build-up

Shell Form Compound is a new smooth-parting, non-caking form lubricant, developed especially for the manufacture of pre-stressed concrete beams and pipe. This unique release agent permits quick stripping of concrete members, leaves a surface that is almost marblelike . . . completely free from pitting, "dusting" and other surface blemishes. Forms remain clean . . . require no scraping.

Shell Form Compound doesn't build up on forms. There is no staining, and concrete paints and coatings can be applied readily to architectural members.

Shell Form Compound is applied as a water emulsion that is very low in cost—approximately 20 cents per gallon for the mixture. One gallon of mixture will cover a full 140-ft. double-tee bed. No special spraying attachments are required—conventional equipment is suitable.

For more information on Shell Form Compound, write
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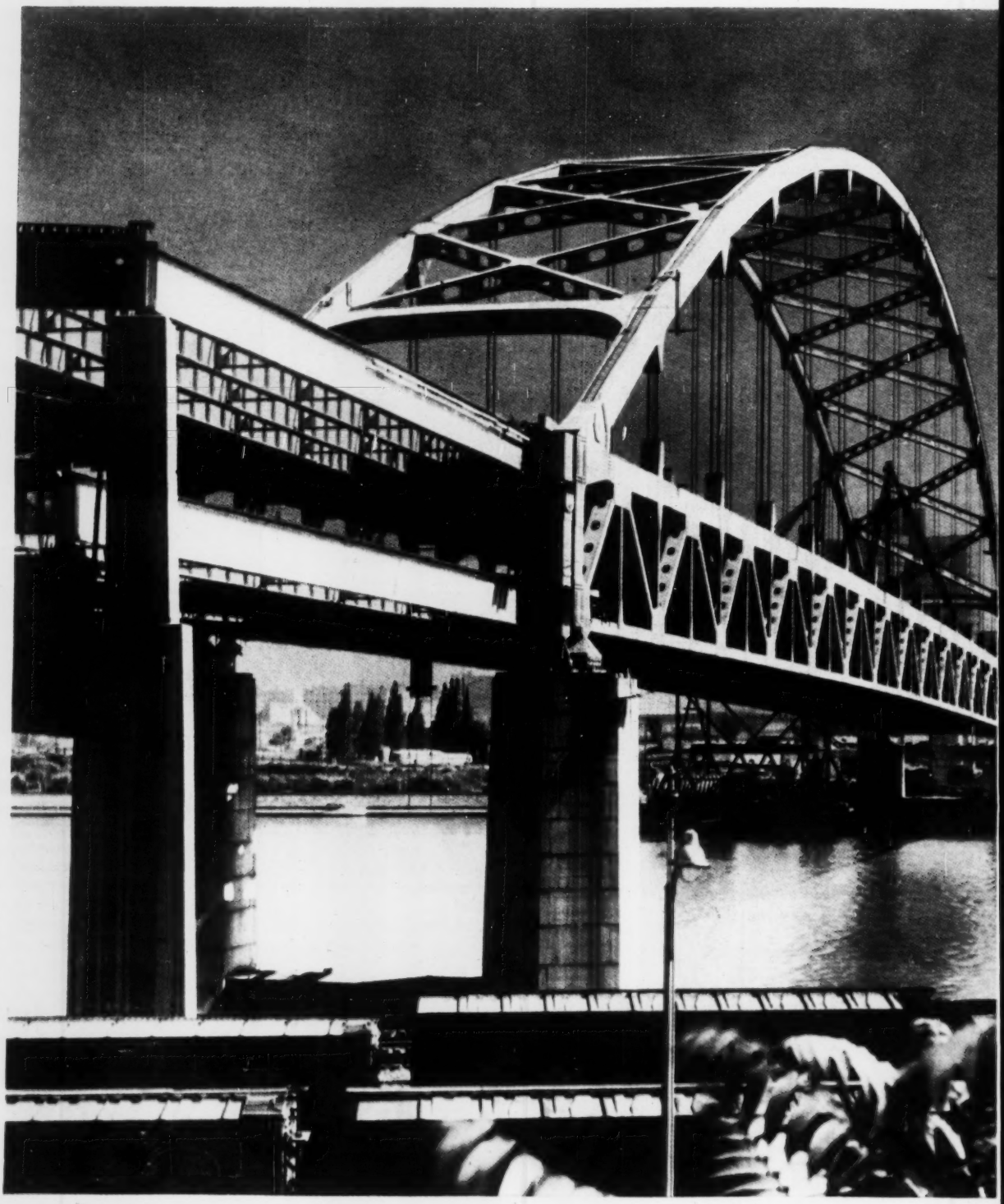

USS MAN-TEN High-Strength Steel

Under the shiny new paint on Pittsburgh's Fort Pitt Bridge is a steel with a reputation—USS MAN-TEN High-Strength Steel. More than two-thirds of the 8,000 tons of steel in the 750-foot span is USS MAN-TEN brand—a steel that delivers high strength (50,000 psi min. yield point) with economy.

The bridge is regarded by engineers as the most unusual structure in the entire Penn-Lincoln Parkway System. It is a double-deck, tied-arch design and will carry four lanes of one-way traffic on each level.

For the heavily stressed members, high-strength steel answered the problem of getting higher allowable stress per dollar by avoiding unnecessary weight. USS MAN-TEN Steel was used in all chords, most diagonals and verticals, and all portal members including end floor beams. The roadways are supported by 112 pre-stressed USS Tiger Brand suspender ropes, each $3\frac{1}{4}$" in diameter with an ultimate strength of 475 tons.

Other USS High-Strength Steels available for construction include USS TRI-TEN High-Strength Low-Alloy Steel which, like USS MAN-TEN, has a minimum yield point of 50,000 psi and which is particularly recommended for welded structures. USS COR-TEN High-Strength Low-Alloy Steel also has a 50,000 psi minimum yield point and, because of its outstanding resistance to atmospheric corrosion and superior paint adherence qualities, is a "natural" for riveted structures located in corrosive areas. Where an extra high yield strength steel is needed, we offer USS "T-1" Constructional Alloy Steel which combines weldability and toughness with 100,000 psi minimum yield strength.

For complete information on any of these steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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New color movie available—"Challenge at Carquinez." A 27-minute, 16mm. color film showing the design and construction of the unique Carquinez Strait Bridge. Ideal for engineering groups. For booking information write United States Steel, Pittsburgh Film Distribution Center, 525 William Penn Place, Pittsburgh 30, Pa.

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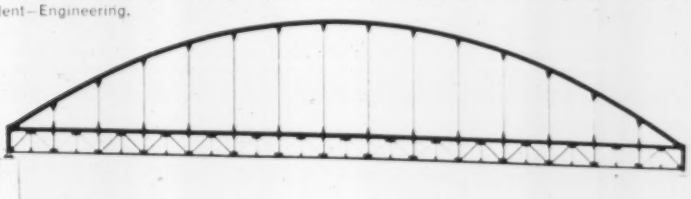
USS

Some of the men who played major roles in making the new Fort Pitt Bridge at Pittsburgh a reality: left to right are Alan A. Porter, American Bridge Division's Vice President—Construction; George S. Richardson, consulting engineer, designer of the bridge; Leonard J. Curran, District Engineer, Pennsylvania Department of Highways; and Arthur S. Marvin, American Bridge Division's Vice President—Engineering.



Where high-strength steel saves money. Profile of bridge showing parts made of USS MAN-TEN Steel in heavy lines. For these members, MAN-TEN Steel's high strength and relatively low cost made it the economical steel to use.

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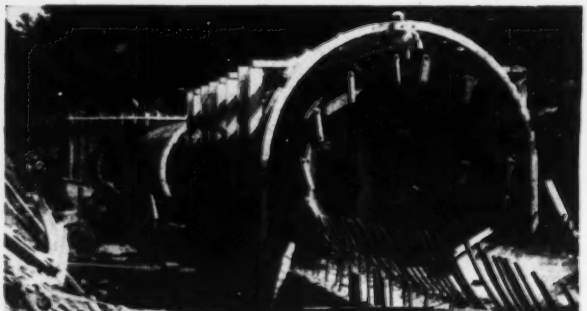

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For Better Data

Census Bureau takes over construction statistics

To beef up its generally weak reporting on construction statistics, the federal government next month is turning over the prime responsibility to the Census Bureau.

Responsibility up to now has been divided between the Commerce Department, which includes the Census Bureau, and the Bureau of Labor Statistics. Lack of clear-cut authority and interdepartmental friction has resulted in sketchy data on construction, generally considered among the least satisfactory areas of U. S. reporting on business.

The Census Bureau intends to use its vast statistical resources to do more direct polling on a wider sample basis. And the bureau's greater manpower will permit better reporting on specific construction areas.

Monthly reports on expenditures for construction put in place, housing starts and building permits will be issued by a new division of the bureau.

Previously, the Bureau of Labor Statistics reported on housing starts and public construction expenditures. The Construction Division of Commerce Department's Business and Defense Services Administration had handled private spending and building reports.

The two agencies had conducted a running feud over this setup for years, each petitioning the White House for authority to take over the full job. The matter was finally settled earlier.

It was agreed to let Commerce take over the main construction job. In exchange, Commerce bowed out of the monthly employment report and turned over the unemployment census to the BLS.

Under the new agreement, BLS will continue to report on employment in the construction industry. The bureau will also renew an old program of studies on labor requirements in construction to determine, for example, the labor input needed for billion-dollar highway programs, or for various other big construction projects.

The Census Bureau will issue its first construction reports for July. It plans to follow the same procedures used previously by BLS and BDSA for the first few months.

By late summer, however, the bureau plans to introduce more direct polls to secure construction data. It also plans a "good deal" of experimentation and development work to improve the data.

Construction statistics had been arrived at mainly by indirect methods. Little direct reporting on actual construction work was done.

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New Mn Wrought Iron is not a substitute for 4-D Wrought Iron. Mn was developed *specifically* to meet critical engineering needs for a tough, yet economical metal in low temperature services where the possibility of brittle failure poses design problems.

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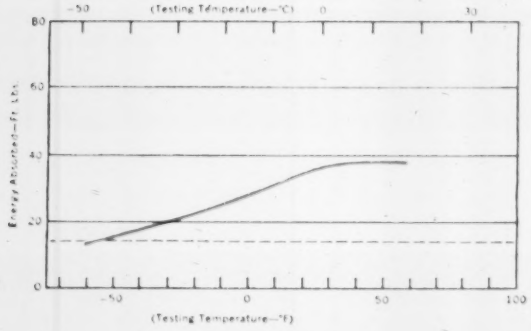
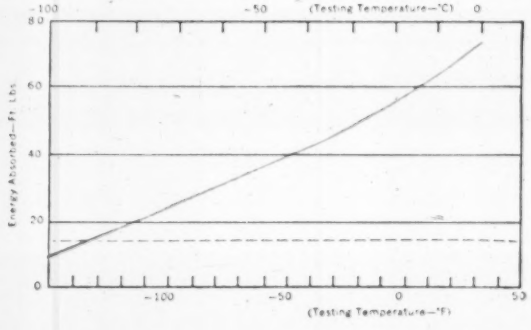
Mn Wrought Iron costs *less* initially than many of the low alloy steels recommended for low temperature service. Available in pipe, plate, and other forms, this new material is well suited for a wide variety of low temperature applications, including such services as tanks and process piping in the refrigeration and petrochemical industries.

Inquiries regarding this specialty wrought iron will receive immediate attention. Write: A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

Charpy impact values for Charpy V-notch specimens machined from conventionally-produced ½" Mn Wrought Iron plate in as-rolled condition.



Mean energy absorption: 15 ft-lbs at −58°F, notch perpendicular.



Mean energy absorption: 15 ft-lbs at −125°F, notch parallel.

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Hiring Cleanup Must Continue

NLRB official hails moderate approach to closed shop clampdown, foresees no change in enforcement

Jerome D. Fenton, outgoing general counsel of the National Labor Relations Board, views the orderly and moderate development of the law on construction industry hiring practices as one of the major achievements of his two years in office.

That is what he told an audience of several hundred plumbing contractors last week at the ??th annual convention of the National Association of Plumbing Contractors at Miami Beach.

In a vigorous defense of the Mountain-Pacific and Brown-Olds decisions on hiring halls and referral systems, **Mr. Fenton said the cases have produced "a happy transformation from certain illegal practices in the field of exclusive referral systems** and, I trust, have engendered renewed confidence in the fairness of NLRB policies and procedures."

The Mountain-Pacific decision marked a turning point in the board's efforts to stamp out the closed shop, which had flourished in the construction industry despite its illegality. Handed down in April 1958, the decision was a mandate to the industry to refrain in every form from making union membership prerequisite to employment. The Brown-Olds decision contains the formula for computing the financial penalties imposed for violating the Mountain-Pacific mandate.

Mr. Fenton said he expected it would be another year or two before the NLRB mandate and remedy are ruled on by the Supreme Court and predicted that they will continue to be applied in the meantime even if there is a change in the Administration.

When asked if there is any way an employer group and a union can find out if a proposed hiring arrangement meets the requirements of the law as spelled out by the NLRB, Mr. Fenton said it is not up to the board to go around sticking its nose into private contracts and business. But he added that it does not take much ingenuity to get a contract tested.

"If hiring arrangements are sanitized and both parties are straight forward," Mr. Fenton observed, "then I can see no trouble. The NLRB is not after a pound of flesh and we feel there is a genuine desire to run clean hiring halls."

This, he indicated, was the thought behind last year's moratorium on the application of the Brown-Olds remedy—a moratorium, he said, that was inaugurated by "the general counsel with the cooperation of the NLRB."

Purpose of the moratorium, Mr. Fenton said, was to prevent a sharp showdown on the hiring problem and to give members of the industry time to take "adequate protective measures" before the full impact of the "stringent remedy" occurred. The moratorium lasted for several months.

"A large number of contractual hiring arrangements have been brought into conformity with the act," he noted, "and it is anticipated that occasions for resort to the reimbursement remedy in hiring hall situations will eventually be few and far between."

Mr. Fenton warned, however, that "there are plenty of indications that the Mountain-Pacific tributary of the Brown-Olds stream has not by any means dried up."

"It is to be expected that the Brown-Olds remedy," he added, "will be applied wherever practices illegal under the act remain as before. And there seems to be nothing unreasonable or arbitrary in this prospect. For it is only practices which conflict with the basic national labor policy which are truly in danger."

At a press conference following his address to the convention delegates, Mr. Fenton thrust aside the suggestion that the present thinking on hiring practices represented a political decision that might be overthrown with a change in the Administration. He said he feels it is basically sound.

Mr. Fenton said he expects the first court test of the Brown-Olds remedy to come out of a California case. There are about five other cases on tap, he added, and a series of conflicting decisions necessitating a Supreme Court ruling is not unlikely.

The Mountain-Pacific decision is now on appeal in California.

Labor in Brief . . .

• **Union election**—The Sheet Metal Workers International Association will name a successor to Robert Byron at a meeting of the executive board to be held in Atlantic City June 22. The 79-year-old Chicago labor leader had been president of the association since 1939. He died May 30.

• **Union shop**—Counties do not have the legal power to outlaw union shops by ordinance because that power is reserved to the state by federal law. The ruling, issued by the California Supreme Court, voids right-to-work ordinances in Trinity and San Benito Counties.

• **Strike benefits**—The U. S. Supreme Court has agreed to rule—after next October—on whether strike benefits received by union members are subject to federal income tax. Internal Revenue Service believes such benefits are taxable despite a lower court ruling to the contrary. (Unemployment compensation benefits are not taxable.)

• **Worker incentives**—Management has gone about as far as it can in giving financial incentives, such as fringe benefits, to workers. In the future, employers will turn to non-financial devices related to worker pride, aspiration and desire for recognition as a means of improving employees' morale. So says James H. Taylor, industrial relations professor at the University of Michigan, in a new personnel book.

• **Tight money cuts jobs**—Builders in the Canadian Midwest are employing about a tenth of the labor force normal for this time of year because of tight money. Cheapest mortgages for private housing are 7½% and difficult to secure. One result: Winnipeg has a record number of unemployed carpenters.

• **Boycotts outlawed**—A Nebraska bill outlawing secondary boycotts by labor unions has become law without the governor's signature. Gov. Ralph G. Brooks (D.) questioned its constitutionality.

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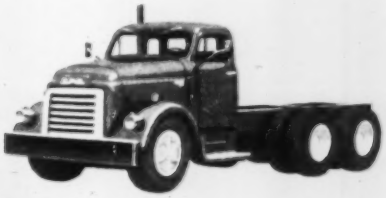

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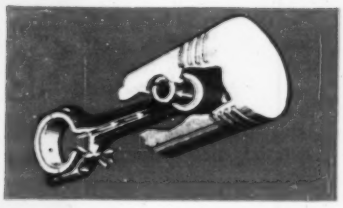

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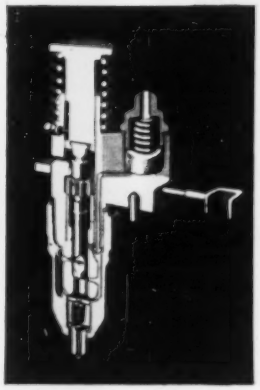

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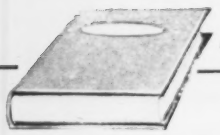

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Owner-Driver May Be 'Employee'

An analysis of federal labor laws shows some of the problems in using "independent contractors"

Can you, as an employer, tell the difference between an "employee" and an "independent contractor?" Into which category does a truckdriver-owner fall?

If you know the answer, you know whether to withhold federal income taxes, pay social security and unemployment taxes and comply with the overtime provisions of the Wage-Hour Law. You may also know whether you have to pay prevailing wages under the Davis-Bacon Act.

If you do not know, you may be in trouble.

Because there is no clear-cut answer to the problem, the National Sand and Gravel Association has just completed a legal analysis of the laws' application to owner-drivers in the sand, gravel and ready-mixed concrete industries. The association's general conclusions may be of some help to contractors, particularly those who are participating in the federal highway program.

"No categorical answer can be given to the question as to whether an owner-driver is an employee or an independent contractor," says the association. "The question is raised differently under applicable statutes and final answer depends on the nature of the owner-driver's relationship with the employer." The association warns that a "lot of money rides on the question and that a wrong answer may be very expensive."

One of the knottiest problems arises under the Davis-Bacon provisions of the Federal Highway Act. The law requires contractors and subcontractors on the Interstate System to pay prevailing wages to all mechanics and laborers on the project regardless of any contractual arrangement that may be designed as a subterfuge to make them independent contractors.

The Labor Department has ruled that where a contractor or subcontractor employs individual owner-operators of trucks or other vehicles instead of operating his own equipment, the operators are employees entitled to the law's protection. It has also ruled that a quarry exclusively furnishing materials to a construction project covered by the law is, in turn, subject to the prevailing wage requirements.

However, owner-drivers who haul for an established firm supplying construction materials in the locality of the project are not covered by the Davis-Bacon Act, nor is the sand and gravel firm covered. But trucking firms that have a hauling contract with the contractor are not excluded.

Key to Davis-Bacon coverage, according to the association, is "the status of the company at whose request the trucking is done, i.e. whether the company is a contractor or subcontractor on the construction job."

Typical sand, gravel and ready-mixed concrete operations, the association concludes, are not covered by the law, and coverage of owner-drivers engaged by material men is the exception.

Unlike the Davis-Bacon situation, where coverage depends on the status of the employer, the employment tax and wage-hour obligations flow from an employer-employee relationship.

Charles Horsky, counsel to the National Sand and Gravel Association, points out that the employment tax laws, as amended, apply the common law test of "employee" in answering this question: Must you pay a social security tax and an unemployment tax and withhold income taxes?

One of the principal factors in the employee test is the degree of control and direction of the individuals involved. Result is that application of the laws depends on the facts of the individual case.

In typical operations of members of the sand, gravel and ready-mixed concrete industries, Mr. Horsky says, the employment tax laws do not apply to truckdriver-owners.

A more nebulous situation comes up under the Wage-Hour Law, which applies to work in interstate commerce and which calls for overtime pay for hours in excess of 40 a week.

Here, the employee-employer relationship still controls but the test is not limited to common law concepts. The courts will look at the "total situation"—what they call "economic reality."

Result, according to Mr. Horsky, is that truck owner-drivers "are more likely to be held covered 'employees' of material 'men' under the Wage-Hour Law."

None of the conclusions that determine the application of any of these federal laws, however, is decisive in determining who is liable for personal and property damage caused by the operations of owner-drivers. That depends, Mr. Horsky observes, on state laws and on common law principles.

Arbitration Clause

Law requires arbitrator be a disinterested party

An employment contract considered in a New York case provided that any dispute arising from the contract would be settled by submitting it to arbitration by the employer's board of directors, whose decision would be final.

The employee who had entered into the contract was fired. He sued for money he claimed was owed to him under the contract. The employer asked for a court injunction against the suit, contending that the contract provided for arbitration of disputes.

The appellate court ruled that a contract provision naming an interested party as sole arbitrator is invalid.

The trial court granted an injunction. But the appellate court revoked the injunction, ruling that a contract provision naming one of the interested parties as sole arbitrator is valid and unenforceable.

The appellate court held that no man may judge his own cause, regardless of whether actual bias or prejudice can be proved. The law presumes that a party to a dispute cannot be sufficiently disinterested and impartial to judge that controversy, said the court. Therefore, it ruled, no party to a contract can arbitrate to decide disputes under that contract; such an agreement outrages public policy, it said, and is illusory.

Matter of Cross & Brown Co., 167 N.Y.S. 2d 575.

States May Reject Bids Under Local Statutes

State laws may empower state agencies to reject bids because of incompetency, lack of competition.

The Massachusetts Division of Construction advertised for bids for waterproofing a state building under construction. Two of the three bids received were rejected on the grounds that the bidders were incompetent to perform the work. The other bid was rejected on the grounds that it was not reasonable to accept such a bid without competition.

The one qualified contractor sued to compel the Building Construction Department to award it the contract. The action was dismissed.

The Massachusetts Statute provides that "the awarding authority shall reserve the right to reject any sub-bid if it determines that such sub-bid does not represent the sub-bid of a person competent to perform the work . . . or that only one such sub-bid was received and the price is not reasonable for acceptance without competition."

The court held that the word "such" in the statute refers to a person competent to perform the work. It ruled that, under the statute, the awarding authority has the right to reject a bid where there is only one competent bidder, and where the authority does not find the price reasonable without competition.

Brisk Waterproofing Co., Inc. v. Director of the Division of Building Construction, 153 N.E. 2d 750, Supreme Court of Mass., No. 4, 1958.

Court Presumes Party To Contract Knows Its Terms

Parties signing a contract are presumed to know its contents and to have agreed to them, when no fraud or other wrongful act is contemplated. When one signs a contract, he is bound by its terms, even if ignorant of the contents. That is the contract he signs, ruled a New York court, and he is bound by it.

The case arose after the New York Thruway Authority hired an engineering firm to perform engineering services, including detailed design work. For the design portion of the work, the authority agreed to pay 3½% of the estimated construction costs at "current prices" as approved by the authority's superintendent. The contract also stated the "current prices" would be those used by the Department of Public Works.

The engineers claimed payments should be based on prices supplied by them in the cost estimates. The state contended that payments should be based on current prices compiled and published by the Department of Public Works from successful bids on state construction contracts.

The court ruled that the engineering firm could recover no more than 3½% of costs as determined by the state. It held that the engineers were conclusively presumed to have known the terms of the contract, and assented to them, when they signed the contract.

Edwards and Associates v. State, 178 N.Y.S. 2d 287, Court of Claims of New York, March 19, 1959.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

OFFICIAL PROPOSALS

Bids June 25, 1959

Contract Spec. No. FA-SM-140

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N.Y. Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Standard Time on June 25, 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N.Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 84, F.A. NEWBURGH BEACON BRIDGE TO CAREY ROAD, PROJECT I 1-3(24)-, ITEM 5081, DUTCHESS COUNTY WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-140

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N.Y.

(b) Mr. K. G. Rauer, District Engineer, New York State Department of Public Works, Pleasant Valley Road, Poughkeepsie, N.Y.

(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $24,000.00.

Proposals for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF PUBLIC WORKS

Bids June 29, 1959

Construction of Trunk and Lateral Sewers in the Town of Greece, Monroe County, New York

NOTICE IS HEREBY GIVEN that pursuant to resolution of the Town Board of the Town of Greece, Monroe County, New York, sealed proposals will be received on the 29th day of June, 1959 at 2:00 o'clock P.M. at the Town Hall, 2505 Ridge Road, West Rochester 25, New York for the furnishing of all materials, tools, equipment and labor for the construction of sanitary trunk sewers and appurtenances in Sanitary Sewer District No. 1, Extension No. 27 in accordance with the contract documents therefore, prepared by Nussbaumer, Clarke & Velzy, Consulting Engineers, and all of which are on file with the Town Clerk, 2505 Ridge Road West, Rochester 25, New York, also at the office of Nussbaumer, Clarke & Velzy, 327 Franklin Street, Buffalo 2, New York. One (1) copy of said proposed documents may be obtained upon payment to the order of Gordon A. Hower, Supervisor, of a certified check for $25.00.

Each bid must be accompanied by security in an amount not less than five per centum (5%) of the amount of the bid in the form and subject to the conditions provided in the Information for Bidders contained in the Contract Documents.

The right is reserved to waive any informalities in the bids and to reject any or all bids.

N. RAYMOND KRAFT, Town Clerk

Bids: June 25, 1959.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M. advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 25th day of June, 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 333 Broadway, Albany 1, New York						
Albany (Rte. 9 & 155)	R.C. 59-91	London Road, S.H. 22 Shakers Watervliet, S.H. 879	4.65	Asphalt Concrete Pavement	$8,500 Plans $5	$159,000
Greene (Rte. 9W & 23 & 23A)	R.C. 59-90	Palenville Catskill, S.H. 8231 Saugerties Catskill, Pt. 3, S.H. 5027 Catskill Village, S.H. 5366 Catskill West Coxsackie, Pts. 1A & 1B, S.H. 1934 and S.H. 8414 Rip Van Winkle Bridge, S.H. 8414, S.H. 8852 and Catskill Village Main, Bridge and Spring Streets, S.H. 5685	2.53	Asphalt Concrete Pavement	$6,500 Plans $5	115,000
Schenectady (Rte. 50)	R.C. 59-84	Schenectady Thomas Corners, S.H. 1172	1.46	Asphalt Concrete Pavemen	$3,000 Plans $5	53,000
Washington (Rtes. 4, 22, 22A & 149)	R.C. 59-79	Smiths Basin Hartford, S.H. 802 Sandy Hill Fort Ann, S.H. 803 Comstock Fort Ann, S.H. 1224 Smiths Basin Baldwin Corners, S.H. 1855 Middle Granville Hampton Fair Haven, S.H. 1937 Middle Granville North Granville, S.H. 5648 and Comstock North Granville, S.H. 9016	....	Roadside Development	$800 Plans $5	15,000
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Herkimer (Rte. 28)	FASH 59-12	Herkimer Village West Canada Boulevard Project L-535-1	0.00	Asphalt Concrete Type 1A Pavement = 0.89 Miles Misc. Work = 0.01 Miles	$15,000 Plans $5	271,000
DISTRICT No. 3, F. F. TOWLSON, Acting District Engineer, 333 E. Washington Street, Syracuse, New York						
Cayuga (Rte. 90)	FARC 59-72	Montezuma Cayuga Union Springs, Pt. 2, S.H. 8519 Project F-508-5	4.18	Asphalt Concrete Type 1A Pavement	$7,000 Plans $5	139,000
Onondaga (Rte. 11)	R.C. 59-70	Syracuse Cicero, S.H. 5470	3.30	Asphalt Concrete Type 1A Pavement	$8,500 Plans $5	153,000
Onondaga (Rte. 11A)	FARC 59-71	Skaneateles West Lake, Pts. 3, 4 and 5, S.H. 486 West Lake, Pt. 2, S.H. 292 West Lake, S.H. 48 Skaneateles Connections, S.H. 9079, Proj. S-563-1	4.74	Asphalt Concrete Type 1A Pavement	$7,500 Plans $5	137,000
Oswego (Rte. 48)	R.C. 59-77	Fulton Baldwinsville, Pts. 1 and 2, S.H. 8872	3.58	Asphalt Concrete Type 1A Pavement	$6,000 Plans $5	116,000
Tompkins (Rte. 79)	R.C. 59-81	Enfield Center Ithaca, S.H. 1001	6.42	Asphalt Concrete Type 1A Pavement	$10,000 Plans $5	182,000
Tompkins & Wayne (Rtes. 31B, 366, 14 & 31)	R.C. 59-76	Br. No. 1, Meyers King Ferry, Pts. 1 and 2, S.H. 5720 Br. No. 2 and Br. No. 3, Utica Freeville Dryden, S.H. 5294 and Br. No. E-100, Lyons Village Geneva Street, S.H. 9271		Clean & Paint 4 Bridges	$800 Plans $5	15,000
Wayne (Rte. 89)	FARC 59-62	Clyde Resort, Pt. 3, S.H. 1059 Project S-284-4	1.88	Asphalt Concrete Type 1A Pavement	$11,000 Plans $5	206,000
Wayne (Rte. 14)	R.C. 59-78	Lyons Sodus Point, Pt. 4 S.H. 1786	5.00	Asphalt Concrete Type 1A Pavement	$8,500 Plans $5	150,000
DISTRICT No. 4, R. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston (Rte. 63)	FARC 59-60	Mount Morris Geneseo, S.H. 622 Project F-557-9	3.32	Asphalt Concrete Type 1A Pavement	$14,000 Plans $5	250,000
Monroe (Rte. 104)	FATS 59-7	Winton Road Sea Breeze, Pt. 1, FASH 52-1 Winton Road Sea Breeze, Pt. 2, FASH 56-7 Project I-1067-4	2.77	Traffic Signs & Delineators	$2,000 Plans $5	47,000
Monroe (Rte. 15)	FARC 59-63	West Henrietta Rochester, S.H. 62 Project F-554-4	4.77	Asphalt Concrete Type 1A Pavement	$25,000 Plans $5	433,000
Monroe (Rte. 18)	FARC 59-74	Kendall Mills Hamlin Center, S.H. 8362 Project F-508-7	3.94	Asph. Conc. Type 1A Pavt. = 3.92 Miles Misc. Work = 0.02 Miles	$10,000 Plans $5	162,000
DISTRICT No. 5, E. G. H. YOUSMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Chautauqua & Erie (Rtes. 20 & 240)	R.C. 59-75	Br. No. 1, Orchard Park, Pt. 1, S.H. 68 Br. No. 3, Westfield Viaduct and Approaches, S.H. 9096		Clean and Paint 2 Bridges	$2,000 Plans $5	35,000
Erie (Rte. 18R)	FGRC 59-52	Gardenville Williamsville, Pt. 1, S.H. 1733 Project I-CG-1080-1	0.61	9" Cem. Conc. Pavt. 2 @ 25' Wide R.R. Sep. Plate Girder 3 Sp. 239.3'	$66,000 Plans $5	1,131,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 50 West Main Street, Hornell, New York						
Chemung & Tioga & Steuben (Rtes. 14, 17 & 17C)	R.C. 59-64	Painted Post Addison, Pt. 3, PSC 5334, S.H. 5349A Corning Painted Post, PSC 5355, S.H. 5626 Elmira North Elmira, PSC 4700-2, S.H. 1478 Waverly Owego, Pt. 3, PSC 4760, S.H. 5257, and Owego Candor, Pt. 3, PSC 5092, S.H. 1870		Clean & Paint 5 Bridges	$1,000 Plans $5	17,000
Steuben	FASS 59-16	Allen Road Co. Rd. 22 Project S-257-1	0.32	Asph. Conc. Pavt. Comp. I-Beam Br. 1 Span 231.5'	$20,000 Plans $5	346,000
Steuben	FASS 59-15	Caton-Hendy Creek C.R. 120 Project S-259-1	3.56	Asphalt Concrete Pavement	$6,500 Plans $5	120,000
Tioga	FASS 59-18	Tioga Center Halsey Valley, C.R. 90 Project S-340-1	0.46	Asph. Conc. Pavt., I-Beam Bridge, 1 Sp. 32' Comp. W. I. Beam Bridge, 1 Span 87.5'	$10,000 Plans $5	183,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 414 Van Duzee Street, Watertown, New York						
Saint Lawrence (Rte. 37)	FARC 59-65	Massena Waddington, Pt. 5, S.H. 1658 Massena Waddington, Pts. 1, 2, 3 and 4, S.H. 521 Project F-580-14	8.01	Asph. Conc. Pavt. = 8.02 Mi. Misc. Work = 0.02 Mi.	$92,000 Plans $5	1,682,000
DISTRICT No. 8, K. G. RAUCH, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Westchester (Int. Tour Rte. 187)	I.R.W.I. 59-1	Interstate Route Conn. 520 (Cross Westchester Expressway Bloomingdale Road Connection) Project I-1101-8)	0.66 0.97 Acc.	9" Cem. Conc. Pavt. Vary. Wide = 1.00 Mi. 9" Cem. Conc. with Carb. Black Var. Wide = 0.05 Mi. Asph. Conc. Pavt. = 0.42 Mi. Misc. Work = 0.10 Mi. 5 Hy. Seps. Comp. I-Beams 4 Sp. 203.4', 4 Span 208' and 5 Span 300.7'	$80,000 Plans $5	1,463,000
Westchester	FASS 59-17	Quaker Ridge Road, Co. Rd. 139 Project S-480-1)	1.47 0.88 Acc.	9" Cem. Conc. Pavt. 48' Wide = 2.05 Mi. Asph. Conc. Type 1A Pavt. = 0.50 Mi. Hy. Sep. Reinf. Conc. Rigid Frame, 90.1' Span	$73,000 Plans $5	1,356,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome, Delaware, Otsego, Schoharie, & Sullivan	R.C. 59-67	Br. No. 1, S.H. 5312 Br. No. 1, S.H. 1486 Br. No. 1, S.H. 1608 Br. No. 1, S.H. 1241 Br. No. 1, S.H. 1440 Br. No. 1, S.H. 5183 Br. No. 1, S.H. 5045 Br. No. 1, S.H. 5671 Br. No. 2, S.H. 5443 Br. No. 1, S.H. 1271 Br. No. 1, S.H. 5254 Br. No. 6, S.H. 5527 Br. No. 4, S.H. 1454 Br. No. 1, S.H. 1215 Br. No. 3, S.H. 5234 Br. No. 1, S.H. 1463	....	Clean & Paint 16 Bridge	$5,500 Plans $5	99,000
DISTRICT No. 10, M. E. GOLD, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	FALH 59-1	Long Island Expressway (Jericho Turnpike to South Oyster Bay Road Project I-CG-862-1(8)	5.33 5.86 Acc.	9" Cem. Conc. Pavt. with Carb. Black 2 @ 47' Wide = 2.50 Mi. 9" Cem. Conc. Pavt. Var. Wide = 2.62 Mi. Asph. Conc. Pavt. = 4.24 Mi. Misc. Work = 0.83 Mi. 1 Sp. Ped. Overpass, I-Beam 175' 1 RR Sep. Comp. I-Beam, 1 Sp. 64.3', 4 Hy. Seps. Conc. Rig. Frame 2 Sp. 142.2', 1 Sp. 84.8', 1 Sp. 64' and 2 Sp. 142.3', 1 Hy. Sep. Comp. I-Beam 1 Sp. 65.8'	$440,000 Plans $10	7,803,000

(Continued on the following page)

OFFICIAL PROPOSALS

(Continued from preceding page)

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956," being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wages) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 20 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BERCH McMORRAN
SUPT OF PUBLIC WORKS

Bids: June 18, 1959.

Port Reading Grade Crossing Elimination Project

WOODBRIDGE-CARTERET ROAD
TOWNSHIP OF WOODBRIDGE
COUNTY OF MIDDLESEX
STATE OF NEW JERSEY
THE CENTRAL RAILROAD COMPANY OF NEW JERSEY UNDER ORDER OF THE PUBLIC UTILITY COMMISSION, STATE OF NEW JERSEY
ADVERTISEMENT FOR BIDS

Sealed proposals will be received by The Central Railroad Company of New Jersey, at the office of the Chief Engineer, Located at Jersey City Terminal, Room 44, Foot of Johnston Avenue, Jersey City, New Jersey, until 1:00 PM. DST on Friday, June 19, 1959, and publicly read at that time, for the

Construction of a bridge and approaches to carry the Woodbridge-Carteret Road over the two Main Line tracks of The Central Railroad Company of New Jersey, a bridge and approaches to carry the Woodbridge-Carteret Road over the two Main Line tracks and one Wye track of the Port Reading Railroad, storm drainage system for roadways and grounds, and related street changes.

Principal Quantities Involved:

93,550 cu yds	Embankment fill
1,710 cu yds	Roadway excavation
11,050 sq yds	6" sub-base Class "A" road gravel
10,100 sq yds	Top soiling
11,050 sq yds	6" macadam base course
2,880 tons	Bituminous concrete surface course hot-mixed
1,060 cu yds	Class "A" concrete
1,080 cu yds	Class "B" concrete
310,500 lbs	Reinforcement steel
954,200 lbs	Structural steel
7,800 lin ft	Steel bearing piles
9 each	Manholes
22 each	Catch basins
3,240 lin ft	6" concrete curbs
3,750 lin ft	8" concrete curbs
250 lin ft	Concrete headers
2,880 sq yds	4" concrete sidewalks
1,600 lin ft	R.C. pipe
3,068 sq ft	Concrete crib walls
4,110 lin ft	Wire rope fence
Lump Sum	Demolition of Buildings

Proposal forms, drawings, specifications, bond and insurance requirements may be obtained upon application at the office of the Chief Engineer of the Railroad Company, at the above address, on or after May 26, 1959, by depositing $25.00 per set. A refund in full will be made to bidders upon return of each set in good condition within 30 days of award or rejection of bids.

This work will be awarded as a general contract and the successful bidder will be required to perform with his own organization not less than 50% of the total value of the contract, except for materials or items of work which require specialized knowledge craftsmanship or equipment not ordinarily available in the contractor's organization.

All bidders must comply with Section 1.2.2—"Prequalification of Bidders" as covered in the Standard Specifications 1941 of the New Jersey State Highway Department. Prequalification forms will be furnished by the Administrative Section, State Highway Department, Trenton, N. J. All prequalifications of bidders must be approved by the State Highway Department and proposals will be accepted only from prequalified bidders.

Bids must be made upon the standard proposal forms furnished for this purpose by the Railroad Company and must be enclosed in sealed addressed envelopes bearing on the outside, the name and address of the bidder and the contract work bid upon, and must be accompanied by a certified check drawn to the order of the Treasurer of The Central Railroad Company of New Jersey, in the amount of $15,000. Bids and checks not enclosed in sealed addressed envelopes will also considered informal and will not be opened.

The Railroad Company and/or the Board of Public Utility Commissioners reserve the right to reject any or all proposals.

R. J. Mineth, Chief Engineer
THE CENTRAL RAILROAD COMPANY OF NEW JERSEY
JERSEY CITY TERMINAL
JERSEY CITY 2, N. J.

Bids: June 29, 1959.

Fairfax County, Virginia Integrated Sewerage System

Sealed bids will be received by the Board of County Supervisors of Fairfax County, Virginia, at the office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Monday, June 29, 1959 at 2:00 P.M., Eastern Daylight Saving Time, for the construction of

CONTRACT No. 9A
LOWER PIMMIT RUN TRUNK
(Tunnel & Siphon Section)

Approximately 1727 lineal feet of 42 inch sanitary sewers (1400 lineal feet in tunnel), approximately 375 lineal feet of triple 20" & 24" inch cast iron siphon (245 feet in tunnel).

Promptly thereafter they will be publicly opened and read in the Board of County Supervisors Room, County Office Building, Fairfax, Virginia.

Copies of Plans and Specifications are on file and open to public inspection at the offices of Dodge Reports in Washington and Baltimore, and Associated General Contractors of America in Richmond and Charlotte.

Plans, specifications, and contract documents may be examined and copies thereof may be obtained at the office of the Sanitary Engineer.

All bids must be on separate form furnished by the County.

Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered, if the bid is $20,000 or more.

Each bid must be accompanied by cash, or by the certified check of the bidder, made payable to the Director of Finance, County of Fairfax, Virginia or by an acceptable bidder's bond in an amount not less than Five Percentum (5%) of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price.

No bid may be withdrawn for a period of thirty (30) days after the actual opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

COUNTY OF FAIRFAX, VIRGINIA
By: Harry L. Hale
Sanitary Engineer

Dated: May 28, 1959.

Bids: June 25, 1959.

Contract B.P. 59-75

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Public Building Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., June 25, 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract B.P. 59-75 for
Beach Protection
(Artificial Beach Nourishment and Two Stone Groins)
at East Hampton, Town of East Hampton
Suffolk County, New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, New York.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract B.P. 59-75 may be examined and obtained at the office of Mr. Milton E. Goul, 32 West Main St., Babylon, L. I., New York.

The deposit for Plans and Proposal Forms for Contract B.P. 59-75 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 20 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract B.P. 59-75 is $575,000.00.

Proposals for Contract B.P. 59-75 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the State of New York, Commissioner of Taxation and Finance for the sum of $30,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Public Building Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT OF PUBLIC WORKS

Bids: August 22, 1959.

Republic of Iraq, Development Board & Ministry of Development, Kadhemain Hospital. Contract No. 1/1959

The Development Board and Ministry of Development invite tenders from experienced Building Contractors for the erection and completion of a general Hospital containing 320 beds, a service building consisting of Boiler House, Laundry, Incinerator, Workshops, Garage and Guard House, Quarters for Nurses, and Resident Medical Officers, Residences and Apartments for Doctors, site works and all Incidental and auxiliary work which is required for Kadhemain Hospital, Iraq.

Full information regarding this tender may be inspected from the Ministry of Development, Baghdad, Iraq and from the nearest Iraqi Diplomatic Representative and from the offices of Stephenson & Turner, Architects at 137A Little Collins Street, Melbourne, Australia.

Tender must be submitted in English to the Ministry of Development, 106 of Legal Affairs & Contracts, Baghdad, Iraq, on or before 12 noon 22nd August 1959.

Minister of Development.

Bids: June 16, 1959.

Blue Island Bridges

The Chicago, Rock Island and Pacific Railroad Company, W. B. Throckmorton, Chief Engineer, is taking bids, due on June 16th, 1959 at 1:30 PM Central Daylight time for the fabrication and delivery of structural metal for C.R.I. & P. R.R. Bridges Nos. 159, 159A, 161, 163, 164 and 168 in connection with the Blue Island Group of Bridges on the Calumet Sag Channel Project at Blue Island, Illinois. The estimated total weight of structural metal is 5,700,000 pounds.

Plans and specifications may be obtained at the Engineer of Bridges' office, Room 903, LaSalle Street Station, 139 West Van Buren Street, Chicago 5, Illinois.

OFFICIAL PROPOSALS

Bids: July 1, 1959

Construction of a Water Works System for the Town of Chili, New York

Sealed bids for the construction of a Water Works System for the Chili Water District will be received by the Town Board of the Town of Chili, Monroe County, New York, at the Town Hall until 8:15 o'clock P. M., E.D.T., on the 1st day of July, 1959.

Bidding forms can be obtained and plans and specifications examined at the office of the Town Clerk, at the Town Hill, 3235 Chili Avenue, Rochester, New York; or the office of The Lozier Company, Engineer, 10 Gibbs Street, Rochester, New York.

Copies of plans and specifications may be obtained upon the payment of $25.00 dollars for each set, which will not be refunded.

The work consists of the following:

Section "A"—Approximately 34,000' of 12", 19,00' of 8" and 500' of 6" watermains and appurtenances.

Section "B"—Approximately 30,000' of 12", 37,000' of 8" and 13,000' of 6" watermains and appurtenances.

Section "C"—Approximately 17,000' of 12", 41,000' of 8" and 29,000' of 6" watermains and appurtenances.

Section "D"—Approximately 22,000' of 12", 44,000' of 8" and 15,000' of 6" watermains and appurtenances.

Section "E"—Two water storage standpipes, pumping station and accessories.

Cornelius Onweleen,
TOWN CLERK,
TOWN OF CHILI, NEW YORK

June 11, 1959

Bids: June 25, 1959

Contract O&M-523

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
WATER MAINS AND HYDRANTS
SOUTH OF CITY CHANNEL

Sealed proposals for furnishing all labor, material and equipment to install water main piping and hydrants will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M. Thursday, June 25, 1959, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, June 11, 1959

Bids: July 9, 1959

Construction of Water Transmission Main

Notice is hereby given that sealed bids will be received in accordance with the law by the Erie County Water Authority until ten o'clock A.M. Eastern Daylight Saving Time on the ninth day of July, 1959 at the office of the Authority, 338 Ellicott Square Building, Buffalo 3, New York, for furnishing materials and performing the labor for constructing a forty-two (42") inch diameter water transmission main in the Town of Evans, Erie County, New York, all in accordance with plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York.

Copies of the plans and specifications may be obtained either from the Erie County Water Authority or from the Consulting Engineers upon deposit of Twenty-Five ($25.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within ten (10) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be done includes all materials and labor, tools, plant and equipment necessary for constructing, installing, testing and completing, ready for operation, approximately twenty-five thousand two hundred (25,200') feet of forty-two (42") inch diameter water transmission main with connections to existing mains, valves, air relief and blow-off facilities, manholes and other accessories and appurtenances.

Each proposal must be accompanied by a certified check payable to the Erie County Water Authority or a bid bond to the favor of the Authority from a reliable surety company authorized to do business in the State of New York and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bonds will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for twenty (20) days after their receipt before awarding any contract; and the right is reserved to accept any bid or to reject any or all of them.

ERIE COUNTY WATER AUTHORITY
By: WILLIAM J. CARNEY
Secretary

Buck, Seifert and Jost
Consulting Engineers

Dated: June 11, 1959

Bids: July 6, 1959

Extensions to the Sanitary Sewer System for Village of Wappingers Falls, New York

Sealed Bids will be received until 8:00 P.M., July 6, 1959, in the office of the Board of Trustees, Village of Wappingers Falls, N. Y., for Extensions to Sanitary Sewer System, Village of Wappingers Falls, N. Y., at which time all bids will be publicly opened and read aloud.

Proposal Form, Contract Documents, Plans & Specifications may be obtained from Schuerman & Ackerman, Engineers, 54 Market St., Poughkeepsie, N. Y., and may be examined at the Village Office, Wappingers Falls, N. Y., and at F. W. Dodge Corp., London Shopping Center, 328 Northern Blvd., Albany, N. Y.

A deposit of $20.00 for the first set of Documents and $10.00 each for additional copies to each prospective bidder will be required. Upon return of Documents in good condition within 15 days after bid opening, deposits will be refunded.

A bid bond, or certified check, payable to the Village of Wappingers Falls, N. Y., in the amount of 5 percentum of the bid proposal must accompany each bid as a guarantee that, in case a Contract is awarded to him within 45 days after bid opening, he will, within 10 days after notice of such award, execute the Contract in the form provided and furnish the required performance bond. On failure to do so, he will forfeit the bid bond or check on deposit, as liquidated damages and acceptance of the bid will be contingent upon the fulfillment of this requirement by the Bidder. Bid Bonds or checks of all except the three (3) lowest formal bidders will be returned within 10 days after bid opening; remaining deposits will be returned after execution of a contract between the Owner and the accepted bidder.

The successful bidder shall furnish a performance bond satisfactory to the Board of Trustees and its legal counselor in the amount of the contract and having sureties acceptable to the Owner.

Attention of bidders is invited to the minimum wage schedule to be observed under the Contract.

No bidder may withdraw his bid within 45 days after the date of opening thereof. Any bid may be withdrawn prior to the scheduled time for opening of bids or any authorized postponement thereof. The Board of Trustees reserves the right to waive any informalities in or to reject any or all bids.

ARTHUR T. WEIT — VILLAGE CLERK

Bids: July 15, 1959

GM&O Bridge 216

Sealed bids will be received until July 15th, at 1 P.M., C. S. T., by the Chief Engineer of the Gulf, Mobile and Ohio Railroad Company, 164 St. Francis Street, Mobile, Alabama. Bids will be opened and publicly read at the office of the Chief Engineer at that time. The work will consist of construction of the approaches to GM&O Bridge 216 over the Calumet-Sag Channel, near Lambert, Illinois, 21.6 miles S. of Chicago, and related work. Principal items are 100,000 cy. of embankment, 8,200 sq. yds. of access roads, and drainage pipe.

Two sets of plans and contract documents may be obtained from the Chief Engineer upon deposit of $25.00. No refund will be made for plans and contract documents returned.

Payment may be made by check or P.O. money order.

The work is subject to the inspection both of the Chief Engineer of the Railroad Company and the District Engineer, U. S. Corps of Engineers, Chicago District, Illinois.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 10-5209) will be received at Page, Arizona, until 3 p.m. Mountain Standard Time, July 8, 1959, for furnishing labor and materials for parking area and utilities for Block 17, Page, Arizona, Glen Canyon Unit, Arizona-Utah, Colorado River Storage Project. Location: Page, Arizona on the Colorado River. Principal items are 22,200 cu. yds. excavation; 3,000 tons plant mix bituminous surfacing; 2,100 lin. ft. furnishing and laying 6-inch diameter cast-iron water pipe; and other work. Completion time 90 days. For particulars address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 277, Page, Arizona; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

BRIDGE CONSTRUCTION—U. S. Army Engineer District, Memphis, Corps of Engineers, P.O. Box 97, Memphis 1, Tenn. Sealed bids will be received at this office until 1:30 P.M., C.S.T., 25 June 1959, and then publicly opened, for constructing two county bridges, Round Pond Interior Drainage, St. Francis River, Arkansas. $15.00 deposit required on plans. Information on request.

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

SERVICE MANAGER

Pennsylvania distributor handling tractors, rubber-tired loaders, cranes, and compressors is interested in employing an experienced Service Manager to take complete charge of Service Department. Permanent employment with established company. Salary is open. Send complete resume of background and experience to

P-1831, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

JUNE 25TH ISSUE CLOSES JUNE 15TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No., Classified Ads. Div. of this publication, Send to office nearest you
NEW YORK 36, P. O. BOX 12
CHICAGO 11, 520 N. Michigan Ave.
SAN FRANCISCO 4, 68 Post St.

• POSITIONS VACANT

Assistant City Engineer — Age—Under 50— Civil Engineer College Degree—Two (2) Years Experience. Experience in administration, supervision over men, maintenance work planning, job assignment and plan and design of streets and parks desirable. Write City Clerk, City Hall, Cumberland, Maryland, before June 15, 1959.

Resident Engineer Wanted. Graduate engineer with experience in supervision of construction on water, sewerage, steam power and or building construction. Location generally midwest, but assignments may be to other areas of U. S. Established midwest consulting engineering firm. Reply in detail to P-1293, Engineering News-Record.

Experienced Architects and Architectural Draftsmen. Excellent opportunity with established consulting firm in Middle West. State education, experience and required salary. Reply to P-1545, Engineering News-Record.

Wanted—Graduate Civil Engineer—3 to 5 years field experience layout roads and bridges—interested in permanent position—can progress to Asst. Supt. or Supt. of Construction—Principal working area New York and Pennsylvania. Submit full resume, experience, salary, education. P-1794, Engineering News-Record.

Superintendent wanted for sewer, water, grading and concrete jobs of small and medium size. Ability to estimate and expedite as well as civil engineer training desirable. Salary commensurate with ability to produce. Locate Illinois. Established company. Please furnish resume stating education, experience and salary requirements. P-1529, Engineering News-Record.

Hydraulic Engineer with experience in river hydraulics, stream gaging and analysis of hydrologic data needed to fill vacancy in Hydraulic Data Section. Salary range $6600 to $7800. Opportunity for advancement. Send resume to Chief Engineer, Indiana Flood Control and Water Resource Commission, 1330 West Michigan Street, Indianapolis 7, Indiana.

Instrument or Electrical or Piping Engineer. Engineering and construction firm has position for experienced estimator to broaden his experience by assisting the coordination of design, estimating, purchasing and installation of instrument systems for process type plants. Contracting firm experience preferred. Salary open. Chicago suburban location. Send resume to Mr. W. A. Wenzel, Patrelli, Inc., 2101 N. Hamlin, Skokie, Illinois.

Senior Cost Engineer. Must be familiar with the Uniform System of Accounts for Electric Utilities. Duties will consist of analyzing completed major construction projects for an Electric Utility. Experience with the Federal Power Commission or a State Public Service Commission would be desirable. Some experience with the Property Record Department of an Electric Utility would also be an asset. Please send complete information on experience, references, salary requirements, and availability. Indianapolis Power & Light Co., 25 Monument Circle, Indianapolis 6, Indiana, Employment Division.

Growth Potential: Structural—3-5 years' ex-perience some with fabricator. Sanitary—5-7 years' experience some with public health or operational experience. Both upon proven ability to assume charge of specialty design section for middle-sized consultant located in University City in Midwest. Please include present salary in resume. P-1823, Engineering News-Record.

ENGINEERS

Armour and Company will employ degree engineers with minimum of 10 years experience in the following specialties:

UTILITIES AND POWER PLANT ENGINEERING:

B. S. Engineer, preferably mechanical. Must have good working knowledge of boilers and associated equipment, fuels, water treatment and general power plant apparatus and operations. Must be able to analyze heat balance for cost determination of steam, refrigeration, etc. and to recommend improvements.

ELECTRICAL ENGINEER:

B. S. Electrical Engineering. Experienced in design and specifications for electrical equipment and programs and power distribution. Must be able to establish over all requirements for electrical power, lighting, and equipment services for new facilities and alteration of existing facilities. Will assist in establishing operational and maintenance standards, electrical requirements for new equipment, and investigation of suppliers equipment and contractors' installations.

Age to 40. Will headquarter at General Office, Chicago and travel periodically to plants and branches.

Send detailed resume to:

Armour and Company Personnel Division, P. O. Box 9222, Chicago 90, Illinois

• POSITIONS VACANT

Mechanical Design Engineer: Pulp and Paper Mill machinery and equipment design. Equipment and material selection, specifications and layout. Minimum 5 years' design experience, preferably in the pulp and paper industry. Engineering degree required. Scenic Middle-Atlantic States location. Excellent opportunity. Salary commensurate with ability. P-1830, Engineering News-Record.

Civil Engineer with broad highway back-ground. Should know control of soil work, design and control of concrete and asphaltic mixes, and actual field construction. Personality to function as staff consultant needed. Minimum age—35 years. Salary $7,000 to $12,500. Only complete application will be reviewed. Reply P-1803, Engineering News-Record.

Construction superintendent. C. E. Georgia. Must be experienced General Construction Public Works. Send resume, age, education, previous experience, references, salary desired. P-1806, Engineering News-Record.

Construction assistant superintendent. C. E. Georgia. Some experience preferred. Send resume age, education, previous experience, references, salary desired. P-1805, Engineering News-Record.

Draftsman—Experienced Structural Steel De-tailer and Checker. Permanent position with established consulting firm. Fringe benefits. Submit resume of experience, references, and salary expected. Sanborn, Streeter and Associates, 1234 Cherry Street, Toledo 1, Ohio or 1611 Van Epps Road, Cleveland, Ohio.

Construction Manager to be second man in growing gen. const. firm with $5 million annual volume. Experienced in all manage-ment and field phases of building const., schools, public bldgs., semi-heavy const., no specialization. Degree necessary. Long hours, hard work, headaches. Must be a persistent pusher, and proven profit-maker. Bonus and eventual ownership participation opportunity to invest but not required. Location North East. Send resume and salary to P-1855, Engineering News-Record.

Civil Engineers: Unlimited opportunity with Rochester, N. Y. consulting firm. Excellent salary. P-1874, Engineering News-Record.

(Continued on the following page)

TAKE-OFF ENGINEER

Major West Coast heavy construction contractor operating nationally is seeking an experienced take-off engineer to supervise this part of the estimating program. He would also assist in supervising the trainees in this program. This is an excellent opportunity for a qualified person to join an established expanding organization. Please send complete personal and experience record. Your reply will be kept confidential. Salary open.

P-1824, Engineering News-Record
ex Post St., San Francisco 4, Calif.

RESIDENT ENGINEER
ASSISTANT RESIDENT ENGINEERS
INSPECTION STAFF

For a $10 million rockfill dam with large concrete spillway in Iraq. Two-year contracts with Government of Iraq. Family housing at site, but no local educational facilities for children. Fill type dam construction experience required—preferably rock-fill. Must be fully capable. Positions available within few months. Excellent salaries. Please send complete personal and experience record to James E. Collins, Personnel Manager.

HARZA ENGINEERING COMPANY
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BUILDING DESIGNERS

Positions available in consulting firm for Engineers, Architects and Architectural Draftsmen experienced in building design. Send personal information and experience record to:

STANLEY ENGINEERING COMPANY
Hershey Building Muscatine, Iowa

• POSITIONS VACANT
(Continued from preceding page)

Construction Superintendent—top position for right man with sewage treatment plant & heavy construction experience. Wingate Construction Co., 34 South 17th Street, Phila. 3, Pa.

Florida West Coast Location—Energetic Engineer to organize and operate a sewer and water line division of general building contracting firm. Must have 5 years field and or estimating experience. Top salary plus attractive profit sharing plan. Reply to: P. O. Box 237, St. Petersburg, Florida.

• POSITIONS WANTED

Construction Superintendent B.S.C.E. Hvy. Earthwork, Highways, Flood Control, 15 yrs. exp. bidding, estimating, supervising. E. Eiswirth, 3419 Utah, St. Louis, Mo., Pr. 3-1510.

Const. Foreman or Asst. Supt., 37. Prefers overseas employment but will accept domestic job. 20 yrs. experience commercial industrial construction. Seeking immediate employment. Good references. PW-1760, Engineering News-Record.

Bituminous & Soils Engineer. 28. BS. 6 years experience all phases bituminous concrete and soils work pertaining to highway projects. Includes pavement mix design, quality control of hot-mix plant operations, paving supervision, soil compaction control, etc. Desires to combine bituminous and soils background into permanent position with established organization. PW-1789, Engineering News-Record.

Soils Engineer—M.S. '53—Prof. Eng. N.Y.; presently completing overseas assignment in charge soils and materials testing laboratory, local staff. Work included field investigations, testing, designs and reports. Seeking permanent position with consultant, any location. Married. Available mid-June. PW-1786, Engineering News-Record.

Engineer Estimator: Presently an official and Chief Engineer of large midwest general contractor specializing in industrial construction. Experience in all phases of engineering construction and administration. PW-1703, Engineering News-Record.

Construction Supt. Top level only. Available immediately. Call Akron, Ohio, Walnut 6-0005.

Construction Executive. Wide experience in industrial, institutional, and commercial field as supt., general supt., construction manager. Available soon. PW-1716, Engineering News-Record.

Physician—allround experience. German na-tional, completed contract with US overseas construction Co., Age 33, available for foreign jobs. PW-1730, Engineering News-Record.

Draftsman, age 28, married 10 yrs. exper. all phases civil, some arch. Resume upon request. PW-1805, Engineering News-Record.

Field Supt. Heavy Excavation. 25 years ex-perience, all types of work. PW-1706, Engineering News-Record.

Piping and Instrument Superintendent. 18 years of heavy construction experience, chemical plants, pumping stations, and power plants. USA, Europe or South America. PW-1781, Engineering News-Record.

Construction Executive And Administrator. Twenty-two years in responsible charge of the construction of Industrial, Commercial, Public and Military Installations, including factories, supermarkets, schools, Nike Installations, Atomic Energy Work, refineries, sewage and water treatment plants and other light and heavy construction. Competent graduate Engineer with experience in Civil, Mechanical and Marine Engineering fields. Capable estimator, Administrator, Purchasing Agent and Project Manager, desires connection with progressive firm in Middle Atlantic States Area. Available July. PW-1807, Engineering News-Record.

Executive, thoroughly experienced buildings and Heavy Construction open for connection requiring top man to assume full responsibility. Minimum $15,000. C. O. Sutherland, 58 Churchill Ave., Trenton, N. J. Tel. Ocean 6-1559.

Construction Engineer Manager—Total 32 years experience all phases. Many years foreign. Interested only in ultimate executive position at top level. Prefer to locate Spanish speaking countries or Southwest United States. PW-1805, Engineering News-Record.

• POSITIONS WANTED

Construction Supt. General Construction. PW-1856, Engineering News-Record.

Project Engineer—P.E.—B.S.C.E.—35—Ex-perienced Designer and Construction Manager for large industry; responsibilities include structural, mechanical and electrical installations. Desires responsible position. PW-1848, Engineering News-Record.

Sanitary Engineer. BSSE. PE. 13 yrs. ex-perience including design, estimates, specifications, supervision at section head level. Complete resume and references upon request. PW-1865, Engineering News-Record.

Graduate Civil, age 34, wants to enter heavy construction field with contractor. Experience with highway departments and field and office work for consultant. Right job consultant. Right job acceptable anywhere, but prefer West or Midwest. PW-1870, Engineering News-Record.

Materials Handling Consultant. P. E.—Cur-rent functions staff engineer major conveyor manufacturer; primary duty—being an engineer's engineer. Background structural and mechanical. Experience includes field superintendence, development and project engineering. Connection sought at management level encompassing engineering and economics of material transport and conveyance. Age 40. PW-1850, Engineering News-Record.

• POSITIONS WANTED

Construction Engineer. MIT graduate licensed, estimating, job management heavy construction 8 yrs. exp. legal training New England area. PW-1849, Engineering News-Record.

Construction Engineer. Mechanical—Fifteen years with A. & E. firms and Gen. Contract'rs. Broad experience in Industrial & Commercial Buildings plus Dept. of Defense Facilities. Desires position as Resident Engineer or Field Engineer, preferably near West Coast. PW-1868, Engineering News-Record.

Superintendent. Estimator. Office Engineer. 46, BSCE, heavy construction, excavation, bridges, highways; institutional, commercial and industrial bldgs; water and sewer plants; apt. bldgs & subdivision development. Now available. Will relocate. PW-1861, Engineering News-Record.

M. S. in Sanitary Engineering; 2 years teach-ing experience and 5 years design, construction, and supervision in civil engineering; desires East or S. E. location beginning September '59. PW-1872, Engineering News-Record.

Construction Engineer, 31, graduate, desires responsible office position with small to medium progressive contractor. Experienced Estimator and Field Engineer. Mid-West, or S. W. Consider S. E. PW-1869, Engineering News-Record.

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Complete 16 ft. Diameter Tunnel Spread
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PS-1830, Engineering News-Record

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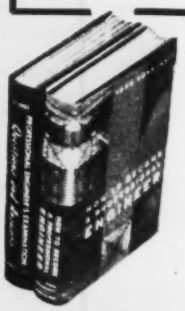

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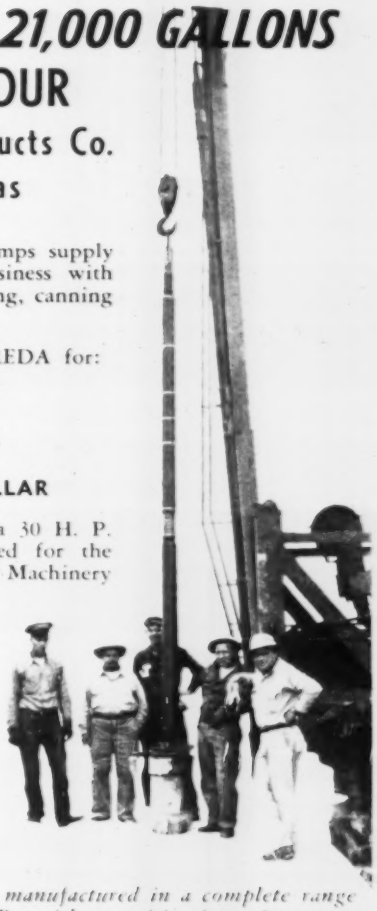

INSTALLATION DATA
PUMPING DEPTH: 432 ft. (water pumped to tower 110 ft. high)
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Conflict of Interest

EMPLOYED ENGINEERS seeking to augment their income by extra, outside jobs have a special moral responsibility to the profession, themselves and their principal employer to avoid conflicts of interest. For those engaged in private business, doing work for a competitor would almost certainly involve a conflict of interest. In the realm of government employment, working during off hours for a private concern with a government contract awarded by the employee's department would also be wrong if the employee's government position were such that he might later be involved in decisions concerning the work he had done. Beyond these obvious examples there are, of course, many degrees of conflict of interest, which employed engineers must weigh by their own moral judgment.

These thoughts are engendered by Congressional testimony just made public that there have been 214 cases during the past 14 years of engineering employees of the Denver office of the Bureau of Reclamation receiving pay for outside work from private engineering firms. The manner in which the testimony was reported left an implication that all of this was wrong and possibly illegal. The facts, we are sure, would lend little or no credence to this implication. Any individual has a perfect right to use his own free hours in any way that he sees fit. The important consideration is that a conflict of interest be avoided. And such avoidance is particularly vital for professional men, such as engineers, whose integrity and honor are their greatest assets.

Freedom of Expression

EMPLOYERS OF ENGINEERS, if they think about it, would no doubt agree with a statement made by N. A. Dougherty, dean emeritus of engineering of the University of Tennessee, in an address to the American Society of Civil Engineers at Cleveland. He said that "if the climate in industry is not such that engineers can express themselves freely, industry is missing the engineer's most valuable contribution to it."

Inasmuch as engineers, now and then, are heard to complain that they find too little encouragement to express their views, to write technical articles about their work or to participate in the affairs of their engineering societies, employers might well ponder the "climate" that Dean Dougherty mentioned, to see if theirs is adequately salubrious.

Only rarely, of course, does an employer have a definite policy restricting freedom of expression by his employees. The more usual case is that certain operating procedures have developed that render such expression difficult. There may be no easy path to management to offer a new idea or an opinion. Articles or papers may have to be cleared by several layers of executives. Permission to take time off to attend technical meetings may be too difficult to obtain.

The fact is that engineers, like everyone else, perform best under encouragement. Beyond that, however, they are professional people, and as such feel an obligation to contribute to the advancement of the art. Denied this opportunity, they are less effective than otherwise, which is a distinct loss to their employers as well as themselves.

Viewed in this light a proper climate for free expression is a controlling factor in a dynamic and growing technology. It is all the more important, therefore, that engineering employers check their own climate to be sure that it measures up.

Motivations and Satisfactions

CHECKING THE CIVIL ENGINEERING SCHOOLS for results of this year's recruiting campaign, ENR reporters produced an interesting by-product. They asked a sampling of some 75 seniors why they chose civil engineering and whether they were glad they did (ENR June 4, p. 22).

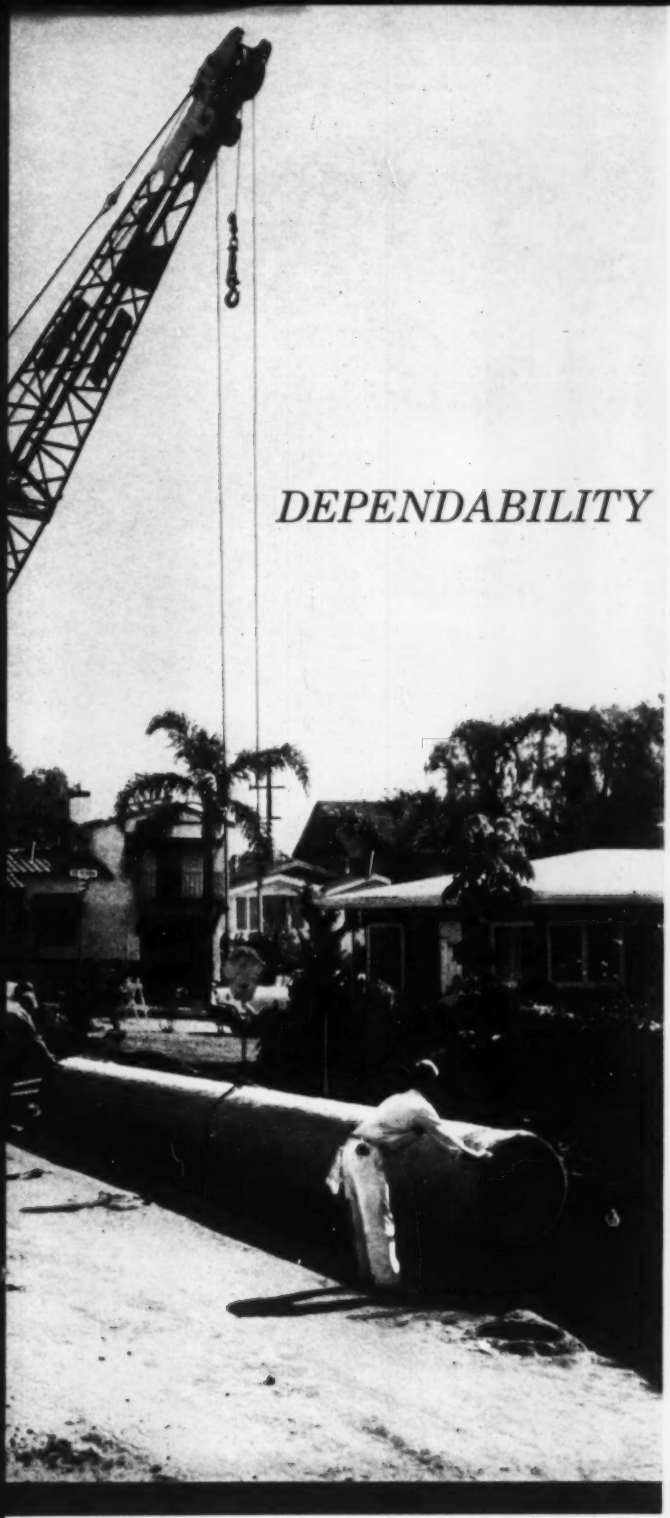
Only a few expressed doubts or disappointment about their choice. The overwhelming majority would choose this same branch of the engineering profession today, knowing what they now do about CE studies and employment opportunities. This is encouraging.

There was fairly general satisfaction, too, with the jobs they were being offered, although the wish that consultants and contractors would show more interest in them was frequently expressed. In contrast they seemed to feel that city, state and federal employers did as effective a job of recruiting as could be expected in view of their usually lower salary structure.

Another significant finding of the survey was that a sizable number of CEs are going directly into graduate work this year. This is encouraging, as was one educator's observation that the master's degree is beginning to rate a financial premium among employers of civil engineers.

Why did these students choose civil engineering? Aptitudes evidenced in high school; an attraction to construction; a construction man in the family; a liking for the outdoors. These were the principal reasons given, and the desire for outdoor work got more mentions than any other. Of course, the whole construction industry doesn't constantly work in the fresh air. But the big and little products of this industry are indeed put together in the open as construction projects. Actually, the industry has a good balance of field and office work.

ENR's check on 75 graduates' reasons for choosing civil engineering was certainly no exhaustive program of motivational research, but it does suggest the value of such a project. And happily, it suggests that whatever motivated them, this year's graduates are not yet disillusioned with their choice.



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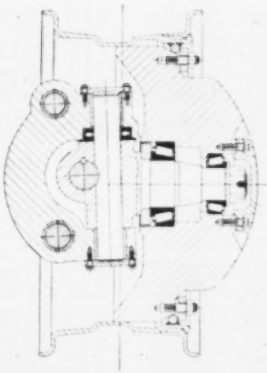

How **GALION** mounts the front end assembly of the T-700 on Timken bearings.

World's largest motor grader weighs more than 20 tons—24 TIMKEN® bearings take the load

THE world's largest motor grader (above) sets up enormous loads as it slams a road into shape. And when it rolls on a steep grade, the thrust loads are even greater. To make sure their T-700 Grade-O-Matic could take *all* the loads, the Galion Iron Works & Manufacturing Company specified 24 Timken® tapered roller bearings—for the reverse gear case, transfer case, front wheels and king pins, and the rear wheel tandem drive.

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